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TRANSACTIONS

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OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1876.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1876.

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The Committee on Publication and Discussion take this opportunity to repeat what they have heretofore stated, that the Society is not to be held responsible for the certainty of the statements or the correctness of the opinions expressed in the papers and discussions now or before published, but undertakes only to present these papers and discussions, or the substance of them, correctly. The award of a prize for an Essay is not to be understood as implying that the Committee approve it in every particular, but only that they believe it calculated, *on the whole*, to promote the science or art of Horticulture.

WILLIAM C. STRONG, *Chairman.*

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 1, 1876.

A stated meeting, duly notified, was holden at 11 o'clock, President Parkman in the chair.

The President made no formal address, but congratulated the Society that the Centennial year found it in so prosperous a condition, and that the harmony of feeling among the members had never been greater.

William Gray, Jr., from the Committee appointed at the October meeting, reported the following vote:

Voted, That in the opinion of the Society it is inexpedient for any member to hold office on more than one of the Standing Committees as mentioned in Section III of the Constitution and By-Laws.

The passage of this vote was advocated by Mr. Gray and Edward S. Rand, Jr. It was opposed by Charles M. Hovey, who approved the general principle, but deemed that in the present condition of the Society, with the comparatively small number of members taking an active part in its work, the passage of such a vote might be found embarrassing in the selection of committees. After considerable discussion the report was accepted and the vote adopted,

William Gray, Jr. resigned as Chairman of the Garden Committee, and as member of the Committee of Arrangements and the Committee for Establishing Prizes.

Edward S. Rand, Jr. resigned as a member of the Committee on Publication and Discussion.

These several resignations were referred to the Executive Committee.

The amendment to the Constitution and By-Laws offered by Marshall P. Wilder at the October meeting, and then entered upon the records, came before the Society for action, but was withdrawn by Mr. Wilder.

Voted, That the Recording Secretary be instructed to give the necessary notice for an election of Recording Secretary on Saturday, February 5th.

Edward S. Rand, Jr. declined to allow his name to be used as candidate for Recording Secretary, as business engagements rendered his regular attendance at the meetings very uncertain.

William C. Strong, Chairman, read the annual report of the Committee on Publication and Discussion.

The Editor, Robert Manning, read his annual report.

These several reports were accepted and referred to the Committee on Publication.

Further time was granted to the Finance Committee and the Treasurer for their annual reports.

The following appropriations, having been voted by the Executive Committee, were made for the year 1876:

For premiums on Flowers, ...	$3,200
" " " Fruits, ...	2,100
" " " Vegetables, ...	1,200
" " " Gardens and Greenhouses, .	300
" the Committee on Publication and Discussion,	300
" the Library, ...	300

The President communicated the appointment by the Executive Committee of Edwin W. Buswell as Treasurer, and of Robert Manning as Secretary, for the year 1876.

JOEL F. FALES, of Walpole,
JAMES H. CLAPP, of Boston,
EDWARD B. CLAPP, of Boston,

were elected to membership.

Adjourned to Saturday, January 8th.

BUSINESS MEETING.

SATURDAY, January 8, 1876.

An adjourned meeting of the Society was holden at 11 o'clock. The President and Vice-Presidents being absent the meeting was called to order by the Recording Secretary, and William C. Strong was chosen President *pro tem.*

The Treasurer, Edwin W. Buswell, presented his annual report.

The Finance Committee presented their annual report.

These reports were severally accepted and referred to the Committee on Publication.

CAROLINE L. TALLANT, of Roxbury,
was elected to membership.

Adjourned to Saturday, February 5.

MEETING FOR DISCUSSION.

William C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The following essay, for which a prize had been awarded, was read by the writer:

GRAPE CULTURE IN GARDENS AND ON BUILDINGS, WITH A LIST OF VARIETIES BEST ADAPTED TO SUCH PURPOSES.

BY WILLIAM N. BARNETT, WEST HAVEN, CONN.

The grape is the noblest fruit that the temperate zone produces. Grain and grapes are royal productions and give to gold its value. A prolonged famine of either would well nigh ruin France, and draw more gold from it than Prussia did by the late war.

Grape culture has its history from the time of Noah: the history of horticulture, therefore, commences at his vineyard. Asia and Europe, in all ages, have devoted their best energies to cultivating the vine and improving its varieties. These, in Europe, are all derived, it is supposed, from the *Vitis vinifera*, and when trans-

planted to America prove, in the open air, a failure in southern and central New England, and the corresponding vine region westward.

These remarks, therefore, will specially apply to this region, but may also be applicable to a narrow belt in proper situations even north of it.

Several species are indigenous to this latitude, but the varieties mostly cultivated are from the *Vitis Labrusca*, with a few known as hybrids. With these specially in mind, a few general remarks may not be irrelevant before proceeding to details; and yet these details must be brief and imperfect, for theory, argument, and fact, all wanted to give it force, must be condensed in an essay like this. But we will glance at the principles involved in the great art of grape culture, the conditions upon which success depends, and the practice best adapted to fulfil these conditions. We can give the ground work to the amateur, and his interest may be enlisted. If so, fascination soon follows and his study becomes a pleasure, while his knowledge is increasing. The use that is made of this knowledge is the key to his success.

The fruiting vine requires a warm, dry, and fertile soil, exposed to sun and air, to rain and dew, and the best results are never realized where any one of these requisites is wanting.

To ripen the fruit of most varieties, about a hundred days must intervene from flowering to frost. Ripeness is indicated by ripe seed; not always by the color of the berry. Unlike the pear, it never ripens after it is picked, nor will the cluster mature after the foliage, at and beyond it, is destroyed. Frozen grapes are without value. To protect the wood and fruit buds through the winter, when the mercury falls much below zero, a slight covering is essential.

Large and delicious clusters for the table are productions of art, and require, while growing, intelligent care and skilful handling; and these can only best be given when the vine is grown and trained in such a way as to be readily accessible to the grower's eye and hand. Not the branches only, but the roots also, should be under his control. These must be drained or watered; must be duly fed and guarded from disease; must be protected from winter's cold, and warmed by the summer's sun, else uniform success can never be expected in this latitude. It follows, therefore, that the most perfect system of grape growing calls for a

sheltered locality of moderate elevation; a warm, moist soil with suitable plant food in it, and a system of growth of root, stem, arm, cane, shoot, and cluster, which shall throw the entire plant under the control and management of the viticulturist.

The many treatises that have been published in this country contain much that is valuable, but a good deal is omitted. It is hardly possible to find in any one or in all, the requisites for uniformly successful grape culture in the open air in New England. Here, to mature the fruit, most vines need all the sunshine over the roots that it is possible to give them, but no treatise directs this, except for terraced localities. They need to be trained, while growing, so that they can be readily laid down in winter, but in most plans for training this is entirely ignored. They need too, on the part of the cultivator, a system of thinning out of fruit and checking of foliage, so that the smallest possible amount of seed (for which alone all plants grow and expend their energies, and thus exhaust themselves) is allowed to the greatest weight of fruit; so that no foliage is permitted but that wanted to mature the fruit, and to form root, wood, and bud to carry the next year's crop; and yet what cultivator bestows on these essentials even a passing thought?

We do not wonder then, when we look around and see, and read in journals of failures everywhere. The ruin wrought by cold, by insects, by mildew, and by untimely overbearing, may well be charged to ignorance and sheer neglect, and the noble vine, the first known plant that received culture at the hand of man, endowed with a constitution capable of flourishing for centuries, comes thus to an untimely end. Abandoned often, it is exterminated from the garden and plowed up in the vineyard; or, what is still worse, left standing as a monument to the memory of its owner's stupidity—diseased, half lifeless, with perhaps here and there a few scattered berries, never destined to mature.

I shall say little about propagation, only noting that plants well grown in the open air are the most desirable, because acclimatized, and no cuttings can be better than those known as "rootlings," because the white roots are in early spring drawn out from the cutting without starting the leaf bud, and they are then in a condition to be set out and to bud out as soon as spring opens, with roots ready formed to sustain them. All vines require one season's growth in the nursery before the final planting.

This essay must be too limited to detail the advantages and disadvantages of planting and training as practised in this and other countries. On the writer's grounds are vines* grown on many of the approved systems. The stool, the stake, the fan, and the Thomery systems may each be suited to some localities. But after years of study and personal attention he is convinced that in this climate the following described plan has advantages possessed by no others; perfect in the garden and unequalled in the vineyard.

First: A vine bed † is prepared, of any desired length, on land of moderate elevation and gentle grade. To do this a trench running northerly and southerly is excavated thirty inches deep by ten feet wide. If gravel or sand is at the bottom, no draining is needed; but if the subsoil is retentive, tile, or other draining, must be laid in the usual way. In this trench, the surface soil is replaced, incorporating with it all such fertilizers as form food for the vine, and in such condition and quantity, especially the inorganic parts, as may be supposed to last for an age—leather, hair, horn piths, bones, spent lime, ashes, muck, leaf-mould, turf, etc. Street scrapings and well rotted manure may also be added cautiously; but these should be excluded from contact with the roots of the vine. When this is filled to the depth of twenty inches, that is, ten inches below the surface, the young vines, of one year's growth in the nursery, or layers of the preceding season, are set out in two rows; each row three feet from the centre, and the vines one foot ‡ apart in the row. A single cane is to be grown from each vine, but two buds are allowed to start. When the stronger has grown a foot, stop the weaker one by pinching, and in the fall trim it off. These shoots as they grow should be tied in pairs to a stake. When the canes reach six or more feet in length, they are layered across the bed near to the opposite sides, each row crossing the other, and are collected in sixes at a short stake to the foot of which they are all secured, as shown in Fig. 1.

For each and every six vines thus collected in a hill by layering, a trellis is made thus: twenty feet from the centre of the bed

* About 12,000 vines in all, mostly planted since 1860.

† The writer has beds like this, aggregating in length 3,000 feet, with 6,000 fruiting vines on them, from five to twelve years planted.

‡ This distance is preferred to a greater one, say two feet, because the vines are under better control.

a post is set out and another between that and the hill, fourteen feet from the former and three feet from the hill, all in one line, at a right angle with the length of the bed. A simple trellis of two wires * with a rail on top, five feet high by fourteen feet long, with two feet of space between the ground and the lower wire, and eighteen inches between the wires and the rail above. To the rail and each wire two vines are trained, one on either side. The vines are secured by four-inch pieces of small annealed wire, to hold which on the sides of the rail, large tacks are driven. The bending of these short wires is done much more quickly than

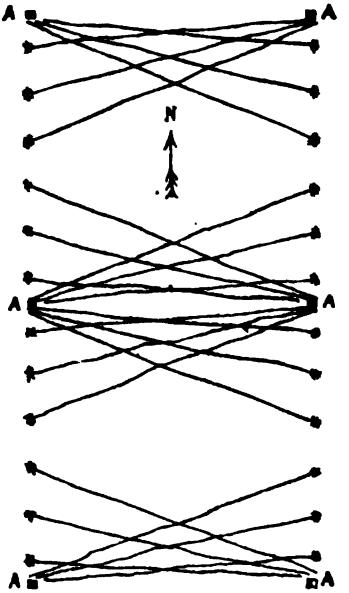

Fig. 1. A, the short stake to which the hill of vines is tied.

tying. The vines thus trained horizontally, and grown each in one single stem and arm or cane, are from seventeen to twenty feet long. On each vine, buds are allowed to grow; the first two feet from the ground, and others one foot apart the entire length; the rest are rubbed out. The shoot from each bud forms a spur on the arm, and each spur is suffered to produce one or two clusters, not more. No canes should be allowed to bear till the spurs are

* If preferred, four wires may be used, with one foot space and one vine on each wire, leaving two vines for the rail. The writer prefers two wires only.

formed. In autumn after the foliage has fallen, the shoots are trimmed to spurs of one or more buds, one only to grow, and the vines are laid down along the bed and covered slightly with turf, sea-weed, straw, hay, or evergreen branches. After the vine is laid down, the plow opens a furrow between the hill and the post, which is three feet from it (the outer sides of the bed), followed by a subsoil plow* which cuts off all roots straying outside of the bed. In April, the covering is removed and the vines are lifted to the trellis. Superfluous buds are rubbed off. The bed is gradually filled till level with the contiguous ground. It is kept free from weeds during the growing season, and is open to the *direct rays of the sun during the best part of the day.* This matures the fruit from one to two weeks earlier than that on vines whose roots are shaded, giving it a higher flavor and greater market value.

In a vineyard, these beds are forty feet apart from centre to centre, and the trellis then is of double length, two sets of vines from different beds meeting at the centre post. The intermediate space of thirty feet between the beds may be cultivated or not. It answers well for strawberries, one row under the trellis, and another half way between the trellises, which are six feet apart. The profit on these berries, with the writer, exceeds the cost of working the entire vineyard.

In a small garden, a main walk through the centre of it, running north and south, after excavating and filling as above directed, might constitute the bed for the roots, the trellises running at right angles on each side of the vine bed or walk.†

Vines on Buildings.—The root bed should be made as already stated; less width is needed for a few vines. It should be as favorable as possible for the sun's rays, and away from the roots and shade of trees. It is not necessary that it should be near the building. The vines, with single canes, can be carried under walks

* Where the plow is an objection, as in a small garden, the sides of the trench for a part of the depth may be curbed with a two-inch brick wall, thin flag-stone, slate, or tile, or where the subsoil is gravel it could be used with liquid water-cement; the gravel held between two boards, as a mould, one inch apart, and the cement puddled in, and boards removed, which would harden and resist the roots if it stood the frost.

† In Fig. 2, A is the short stake to which the hill of vines is tied; B, vine bed in winter; C, vine bed in summer; D, vines in foliage; E, vines pruned; F, trellis in winter; G, vines laid down and covered; H, line on which the roots are pruned.

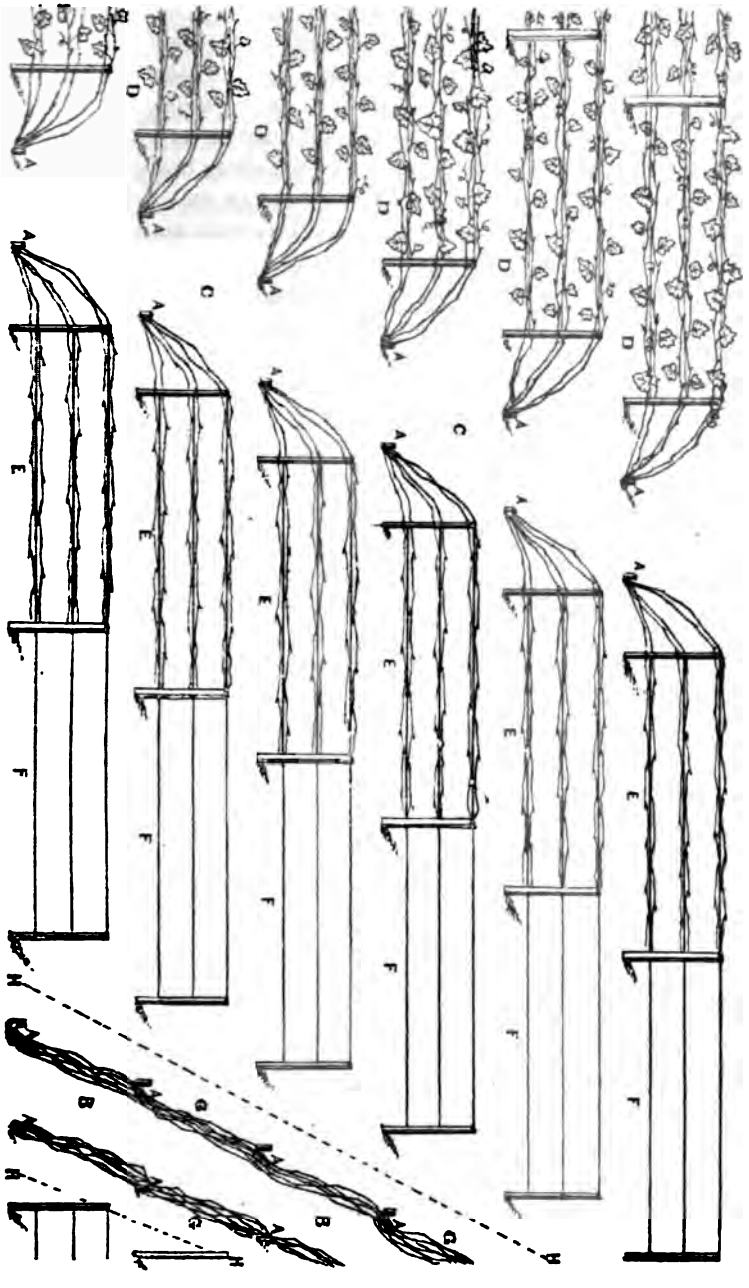

Fig. 2.

and pavements, twenty or more feet, to a trellis constructed on the east, south, and west sides of a building. This trellis should be a few feet from the building and of any desired height, with horizontal wires, three eighths of an inch in diameter and eighteen inches apart, supported by uprights of wood or iron every two or three feet. The vine should be conducted along the upright to the wire upon which it is to be trained to grow and bear, the fruit being produced on a single horizontal arm with spurs, as already stated. As many vines should be planted as there are wires, and these should be firm enough, like a ladder, to sustain the weight of the person who has the care of them. All vines need weekly attention.

Vines on Fences. — Space can be economized in a garden having a fence on the east, north, and west sides of it, by preparing beds of moderate extent, and planting vines one foot from the fence and one or more feet apart. These can be trained horizontally to wires near the fence. They can also be carried perpendicularly to slats or wires, at right angles with the fence, seven feet above the ground, to each of which two vines can be secured. A pleasant walk in summer is under such vines, which with clusters hanging have a most beautiful effect.

It cannot be expected that grapes on buildings will always ripen as early as those in the open garden under the best exposure. The richest fruit is that which grows under the most favorable auspices. The warm and sloping sides of hills covered with calcareous and silicious soils, present great advantages, and are surpassed only by the vine beds in the plan here given; where the sun plays directly on the root bed * unshaded by leaf or cane, for nearly six consecutive hours during the heat of the day, and on alternate sides during the remainder; where its roots are supplied with all the food, organic and inorganic, which the vine requires; where the trellis is so formed that every leaf has full exposure to sun and air and dew, accessible by hand for pinching, training, and guarding from disease and insects, and where the vine is so grown that the single arm, more pliable with increasing age, can be laid down and protected from the severities of winter.

Insects, Disease, and Frost are enemies to the growing vine, and these claim notice. The cut-worm on the green shoot near

* When the fruit is coloring, the bed has a mean temperature of ten degrees greater heat, four inches under ground, than at the shaded sides under the trellises.

the ground, the mealy worm on the starting bud, and a few large insects, are injurious and need watching. *Thrips* is a small insect, wingless in spring, when it attacks the opening bud and blossom, sucking the juices and thus checking the future growth of both leaf and shoot, which soon have a blotched, rusty, and blasted look; later, with wings, it subsists on the leaf. A dry season and shelter tend to increase the numbers, which are often so great as to destroy the vine. They hybernate on the under side of fallen grape leaves and in crevices in wood near by. The remedy is to gather and destroy the fallen leaves when they are damp and cold; the insect then adheres to them. Crevices in wood should be washed with kerosene and soft soap, rubbed together and diluted with tobacco tea.

The root-louse, (*Phylloxera*) is another small insect that burrows in the young roots, sucking nutriment therefrom. The roots become bloated and finally die. The only feasible and effectual remedy is to drown them out by flooding the roots. Any section of a vine bed may be planked at the sides, and, when infested with this insect, flooded for a few days and thus cleared of them. Vines attacked by the phylloxera, when grown in beds like these, have immense advantage over any others where the roots are not under control. Our system here is invaluable.

The fungus known as mildew, (*Oïdium*) attacks feeble vines of some varieties, first appearing in white patches on the under side of the leaf in hot, moist days in June. The leaf soon turns brown and drops off. Mildew also attacks the small green fruit, which soon reddens and ceases to grow, and finally dries up. The remedy is the sulphur bellows, freely used at the first appearance of the disease. To protect the clusters, it is well to sulphur them even before mildew shows itself. The remedy is easy and effectual.

Frost in May often kills the opening bud, and in September the leaf, ruining the ripening fruit. The May and September frosts are usually light, and only a slight protection is wanted. On a clear, still night when the thermometer at sunset falls below 50°, direct radiation, the cause of cold, may be checked by the slightest covering of muslin, fly-netting, or paper. A board one foot wide placed on the top of the trellis is good. For want of these, a smoke started in the garden on the windward side, and kept up at night by brush, leaves, and sawdust, is often effectual.

Varieties, desirable are few in number. Were the Croton and Allen (white), the Iona and Agawam (red), and the Adirondack

and Eumelan (black), varieties without defect, our list would be more complete; but "half hardy roots or canes," or "tender leaf," "subject to mildew," may be said of these and scores of other varieties. The Delaware, for an early grape, and the Wilder for a good keeper, are highly desirable, though the former is a slow grower, and the latter not always proof against the severities of the climate. The Herbert is a large black grape, making fine clusters, early and sweet, and that and the Merrimack, equally hardy, are quite desirable as thrifty and healthy growers, yielding fruit that ripens well and keeps into winter. Rogers' No. 30 and Salem are almost equally desirable; the former, not yet honored with a name, has proved the handsomest in cluster of any grown in this section, while the berry is large, pulpless, and of pleasant flavor. These are all better than the Concord and Martha, the Hartford, the Ives, and the oft rejected Clinton; and yet the Clinton, well grown, is good, sprightly, sweet, and vinous, and the other four, as well as it, are so thrifty, so healthy, so hardy, and mature so early, that we must give them the preference as being the most profitable for general cultivation, as well as best adapted for gardens and buildings. Where foliage more than fruit is sought for a southerly shade or arbor, the King, or Golden Clinton, excels for rapid growth, and has a rich and glossy leaf. The small clusters of white fruit keep well into winter. After testing over sixty varieties, and with an experience in handling thousands of fruiting vines for many years, we regret our inability to furnish anything more than such a list as one which advanced grape amateurs will smile at when they see it. The Hartford, the Concord, and the Martha (white), for the table and for market, and the Ives and Clinton for wine, will yield, under ordinary care, abundance of desirable fruit, though not of the choicest quality, and this is more than can be said of most varieties. Varieties are increasing, needing further trial before warranting, among which are Cambridge and Cornucopia (black), Brighton and Challenge (red), and Elvira and Lady (white), with many others.

Discussion.

Before the essayist had finished reading his paper a discussion arose on the question, whether or not vines were injured by bleeding.

Mr. Barnett had not come to any conclusion, except that it may retard the bud in early spring.

Marshall P. Wilder had caught three junk bottles of sap from

a single vine in his greenhouse, but did not think bleeding injurious.

Charles M. Hovey thought that it injured the vine, not by exhaustion, but by keeping the young terminal buds moist and in a condition unfavorable to free growth.

Dr. G. F. Waters knew a large, wild grape vine in Maine, three inches in diameter, from which a branch an inch in diameter was cut off early in spring, three or four feet from the main stem. The vine bled profusely and never leaved out.

Mr. Hovey thought that this old vine might not have had latent buds enough to start. He did not think that bleeding retarded the budding out of the vine. He had never noticed much difference in the starting of growing vines after being headed down, whether it was done early or late.

Robert Watt differed from Messrs. Wilder and Hovey. He would prune vines in November or December — pruned later they would be injured by bleeding, and if not pruned until March they would not burst an eye. They bled more from the canes of the previous year than from older wood, more when pruned long than when spurred, and more in wet weather than in dry. He had lost vines as the result of bleeding; they died down to the last year's wood.

Mr. Hovey had had under his observation from two to four thousand foreign vines every year, for many years, which had been headed down in the spring to two or three eyes, and he had never, to his knowledge, lost any vines from this cause.

Mr. Watt said that he never cut a vine when he planted it, but set it out at full length, rubbed out all the eyes not wanted, and cut off in June or July.

Josiah W. Talbot said that he pruned Concord and other native grapes when convenient, and had never lost a vine from bleeding.

James Cruickshanks said that wherever there is late pruning there will be bleeding, and asked if this did not weaken the vine.

Hervey Davis had pruned at all times and found no injury. He had not noticed any weakening of the vine.

Mr Hovey said that though vines might not be injured by loss of sap when pruned late, yet early pruning was altogether best. The sap of trees is in motion all the time, as is shown by the fact that the buds of maple and poplar trees swell gradually through the winter. If the vine is pruned early the sap accumulates in

the last bud, giving it additional force, and he would therefore prune in autumn. Camellias or azaleas headed down in October start strongly, but if cut back in April only a few of the top buds break, and those more weakly.

Mr. Watt asked whether the vines which bled profusely had not thrown out thin papery leaves and wiry shoots, and shown other marks of weakness.

Mr. Hovey had noticed no such signs of injury, but believed that an old vine with few buds might be injured by heading down — not, however, from loss of sap but from repletion.

John B. Moore had pruned at all times, and did not think that it made any perceptible difference with out-door grapes when they were pruned. Still, he would rather not have his vines bleed.

Dr. Waters said that though he had stated a fact in regard to the destruction of a large wild grape vine by bleeding, his practice had been to prune when he could, but he preferred the fall for old, and late spring for young vines.

Mr. Barnett exhibited pieces of the vine — arms of old wood — amputated and coated with liquid rubber. From these, when cut in the fall, gum exudes as shown in the specimens, to prevent which the ends were covered by a cement made by dissolving rubber, cut finely, in benzine. He preferred it to liquid grafting wax or dissolved shellac.

The reading of the essay was here resumed, and on its conclusion discussions and inquiries followed.

Mr. Talbot asked whether the vines on the trellises, running east and west, did not shade the ground from the sun.

Mr. Barnett replied that in his system it was immaterial whether or not the ground under the trellis was shaded, because no roots were there, but in the vine bed; the object was to expose all the foliage to the sun and the air.

Mr. Talbot wished to know whether the sun shone on the north side of the vines in September, when the grapes were ripening.

Mr. Barnett replied that the direct action of the sun was needed, not so much on the ripening fruit and wood, as upon the leaf (the upper green surface), and that he believed his trellis exposed every leaf to the sun and air. He read the following extract from Du Breuil:*

* Vineyard Culture, p. 101.

"We know that the direct action of the sun on the entire vine and the soil which gives it nourishment, affects, in an important degree, the quality and quantity of its produce."

He thought that his method hastened the time of ripening from ten to twelve days. His fruit ripened and was sold before his neighbors'. He marketed Concords on the 8th of September, and at that time, and for two weeks after, he had the command of the New Haven market. His idea is that the direct action of the sun on the roots and foliage makes the fruit earlier and sweeter. He did not mulch. On the 20th and 21st of August, when this essay was written, his grapes were coloring, and the mercury in the thermometer averaged, in the soil of the warm vine bed, eleven degrees higher than in the shaded ground at the sides of it, thus giving him the benefit of a climate like that of Vineland, N. J. He thoroughly ripened Concord grapes as early as the middle of September the past season, which was about two weeks later than usual, when most of the Concords in his vicinity failed to ripen before October.

Mr. Hovey said that in 1854 Mr. Bull had Concord grapes fully ripe September 7th, on a sandy sidehill. He thought it did not matter much where the top of a grape vine was, if the roots were in a warm place. He had known Clintons to ripen on top of a maple tree fifty or sixty feet from the ground, when on low trellises they were far from maturity. Mr. Barnett's success was owing to his ground being exposed to the sun.

Mr. Davis thought thirty inches rather deep for the vine bed.

Mr. Barnett said that he began with soil on his land six inches in depth and had been gradually deepening, and now it was mellow and rich down nearly two feet. While his neighbors' strawberries suffered in dry seasons, those which he grew between the trellises were fine, and brought him, at wholesale, thirty cents per quart throughout the season. These retailed for thirty-five cents, or about one cent apiece, being mostly Jucundus, which take thirty to forty berries to make a quart.

Grape roots vary; some, such as the Clinton, have fibrous roots like the maple, while others, such as the Agawam and Catawba, have finger roots, like the tulip tree. In his vine beds, thirty inches deep, they never break down in time of drought, the larger roots sucking up moisture from below while the fibrous roots are feeding near the surface.

J. M. Merrick, Jr.,* had recommended to plant grape vines, twelve to fifteen feet apart every way, but Mr. Barnett could not concur in this, because the vines while young will run too much to wood, and Mr. Merrick found it so, for in the same article he complained that he did not get one-fourth the fruit he should, while Mr. Barnett pinched off two-thirds from his as surplus clusters.

The plan of close planting and collecting six together is an innovation, but when it is followed and the roots confined to the vine bed by root pruning, the vines are under control. He pinched them once during the season, and after that they needed little more pruning; none, if the eyes beyond the cluster were dug out or blinded. The small-fibrous roots were mostly within six inches of the surface, where surface fertilizers readily reach them. He put muck at the bottom of the beds, and after that old turf, spent lime, horn piths, etc., as stated in the essay. Then, after the vines are layered across and into hills, all the grape trimmings and other refuse were put in to fill the bed up as high as the sides of it.

Mr. Hovey said that bringing the vines across the whole breadth of the trench, afforded more exposure to the sun. Mr. Barnett's plan was the same as Du Breuil's system of cordon training, and the old Thomery system, under which the grapes were excellent because the roots were exposed to the sun.

Mr. Barnett said that William Saunders, of the United States Department of Agriculture, with his brother, who is also good authority, said, when they visited his grounds, that he would raise very large and fine clusters by the method pursued. He would plant grapes where you can roast the roots, and sun and air the tops. He had laid the tops down and carried them under ground to buildings, as described in the essay. Dr. Frederick Mohr, one of the best authorities in Germany, a friend of and co-worker with Liebig, says that the sun eliminates oxygen from the leaves, leaving carbon and water; and that, without this action, there are no rich products stored up in the vine. The nourishment is taken by the root and conducted to the leaf, where the carbonic acid is decomposed by the sun acting on the leaf, eliminating oxygen and leaving hydrates of carbon, such as grape sugar, starch, woody fibre, and the other rich products of the vine, so that the root, the leaf, and the sun must all work together to perfect the crop.

* Tilton's Journal of Horticulture, Vol. IV, pp. 242—244.

In answer to an enquiry Mr. Barnett said that, after pinching, the laterals do not grow long enough to be troublesome. He pinches the shoots two leaves beyond the cluster as soon as the vine has done blossoming, and removes all but one cluster of fruit. Dr. Waters asked what would be the effect if the leaves at and beyond the cluster were removed; and Mr. Barnett's reply was that if that took place before the fruit colored, it would be hard and sour as vinegar.

Dr. Waters said that he could show bushels of Clintons grown at the ends of the shoots, as sweet as ever Clintons were.

Mr. Barnett said that he could not agree with him from his own experience, and referred to standard authorities to corroborate his statement.* In reply to a question, Mr. Barnett said that he left the end of the main shoot unpinched, for a safety-valve, and sometimes another strong shoot where an arm was to be replaced by a new one.

Mr. Hovey said that the immense bunches of grapes that have been grown in Europe within the past few years, have been borne mostly on long shoots. Every bit of growth that you can get at the extremity adds so much to the strength of the vine.

Mr. Barnett exhibited a portion of a root which had had the end cut off in root pruning, showing that they do not extend much beyond the beds. The laterals, which start after pinching, extend about a foot from the trellis. In building the trellis, where there are parallel vine beds, a large post is required in the centre, but at the ends a fence picket three inches wide by six feet in length is sufficient, as the vines brace the ends. He used old telegraph wire, which he bought at a low price, preferring it to galvanized wire, as less apt to burn the shoots, on account of its rust. He estimated the cost of excavating, refilling, fertilizing, stocking the vine bed, and trellising, at twenty-five cents per vine; that the value of the vines, if cultivated and uncropped, would increase to double this cost, annually, for six years, and then might be suffered to bear and produce annually three or four tons of grapes per acre, equal to three or four hundred dollars at the present value, and that there are one million acres of waste land in this State suitable for the vine. As the trellis covers three-fourths of the land, the soil from it, if not needed for other uses, might go into the vine beds

* See Mohr on the Grape Vine, New York, 1867, pp. 30, 31.

on the remaining fourth. In order to awaken interest, the State needed a sample vineyard, and a public teacher, as in France, where one-fifth of the entire vine region is utilized in grape culture. He exhibited pieces of wire and rail from his trellis, showing its simple construction and the facilities for attaching to and detaching from it, the vines. He spoke of a horizontal or platform trellis about two feet from the ground, with wires occupying all but a two-feet walk, but he preferred the vertical one described in the essay; and hills of six, instead of hills containing three, or half the number of vines, as by close planting he better controlled the growth both of root and shoot. As for protection in winter the single arm system best facilitates it; the rest of the pruning—the canes and spurs—is optional. A well developed bud on a long or short spur will always fruit if the wood is rightly grown. Mr. Blanchard says he has raised clusters from sixteen to thirty ounces in weight. Mr. Barnett had raised them as heavy as twenty ounces, but a pound is large enough. He started on the two-armed system, but could not lay the vines down, while the single arms can be easily swung round and a little trash thrown over them. Even perfectly ripened wood is better laid down, because if not winter killed by exposure yet the buds make a better start in spring. He had lost buds and spurs on ripened wood by not laying down, and the expense was not five dollars per acre. The vines should not be layered before they are long enough to reach across to the hill, as it would otherwise produce confusion. All shoots or suckers proceeding from the layered canes are cut off in hoeing, and all the prunings, leaves, etc., are placed in the trench. Nothing is burned except for making smoke on frosty nights.

Mr. Moore said that in his experience it made no difference with regard to the vines whether he pruned early or late, but if he pruned early the work was out of the way. Bleeding, if it does no harm, does no good. Deep borders certainly make the fruit later. Of two Isabellas which he planted, one in a one foot and the other in a three feet trench, the fruit of the latter was two weeks later. In this latitude we must get our grapes ripe in less than a hundred days from blooming. His grapes did not bloom until the 23d of June, and he commonly got grapes fit for market the middle of September. Mr. Barnett thought grapes would not ripen as early when trained on a building as on a trellis, but Mr. Moore said they would, if the border was on the south side of the house.

Mr. Barnett had recommended the Delaware, Merrimack, Wilder, and similar varieties, but he winds up by saying that none are reliable but the Hartford, Concord, and Martha. Any system that will give you a trellis of well ripened wood will give you grapes. Mr. Moore did not believe in laying down and covering vines. Concords with well ripened wood will stand 20° below zero. His vines are not injured in the tops by such severe cold, but the roots are killed. He thought sudden changes worse than extreme cold. He finds that the fruit ripens earlier when the ground is mulched—the gain by protecting the roots compensates for the loss of heat in summer.

The native and foreign grapes are very different in habit—the native will not stand severe pruning. In the Concord the base bud is apt to be a leaf bud, and consequently the spurs should not be pruned back to a single eye. He was surprised at Mr. Barnett's statement that grapes would not ripen as early when trained on buildings as on a trellis, and he had been astonished to find grapes ripening earlier on stakes than on trellises, but he quickly saw that the reason was that where they were tied to stakes more sun was admitted to the ground. He took the premium on grapes the 4th of September, less than seventy days from the time of blooming, though we are a week or ten days later than at New Haven.

Mr. Barnett replied that Mr. Moore had misunderstood his statement in regard to the comparative earliness of grapes on buildings and on trellises, and referred to the essay, which reads thus about "grapes on the east, south, and west sides"—"It cannot be expected that grapes on buildings will *always* ripen as early as those in the open garden under the *best* exposure." "As to the time required for the maturing of grapes, Mr. Moore had spoken of seventy days from blooming, which would be grand if possible to *fully ripen* them in that time, but Mr. Barnett assured him that what he had said in the essay, viz., "about a hundred days must intervene from flowering to frost" was strictly correct, and his own observations were confirmed by those of others, in support of which he referred to the article, "Grape Statistics," at Newburg, N. Y., in the "Horticulturist," Vol. XX, p. 23; which reads thus: "Any one that will *fully ripen*, year after year by the 25th of September is worthy of cultivation, say within *one hundred days after blooming*. The time varies from 90 to 122 days," "as shown in the

following table:—Allen 95, Catawba 102, Concord 96, Delaware 99, Hartford 90, Anna 122, Clinton 107, Diana 108, Isabella 105, Northern Muscadine 93, Rebecca 97." "Blossoming averages about the 15th of June."

Mr. Wilder said that though gentlemen may believe that well ripened wood will never be injured, there will come a winter when even the hardiest, Concords and all, will be injured if exposed. Mr. Barnett had quoted Du Breuil and other foreign authors, to which a gentleman had made exception, as inapplicable here. But Mr. Wilder said that the laws of vegetable growth, as given by those writers, were unchangeable, and applied as forcibly here as in Europe. And he further remarked that the essay and its discussion had proved a matter of much interest to him, for which he made acknowledgment.

The essay was illustrated by diagrams on the blackboard, and drawings on the cover, and the discussion was longer and more animated than any previous one. The meeting adjourned one week for further consideration of the same subject.

MEETING FOR DISCUSSION.

SATURDAY, January 15, 1876.

In the absence of the President and Vice-Presidents the chair was again occupied by William C. Strong, Chairman of the Committee on Discussion, who called on John B. Moore to open the discussion.

Mr. Moore said Mr. Barnett's essay was very well written, and though he differed from many of the positions taken in it, he felt much satisfaction in listening to it.

Mr. Barnett wanted a soil both warm and moist, which is an impossibility, for the effect of water is to make the soil cold, but probably he did not mean a wet soil. He wanted a sheltered place for his vines, which Mr. Moore agreed was desirable. He had the vine bed filled with lasting fertilizers, forming almost such a border as those formerly made for foreign vines in houses. Now

a deep border means late ripening, and in this climate we cannot spare a single day. If you require a longer season to ripen the fruit, you must have the same for the wood. Mr. Moore again spoke of the two Isabella vines to which he alluded at the previous meeting. These both had a southern exposure; the first one planted had very little preparation, but in the hope to get finer fruit from the second the border was made three feet deep, and to his astonishment the fruit was ten days later than that of the first. Mr. Moore did not believe we needed a border of greater depth than that of ordinary plowing. Mr. Barnett's vine bed occupies only one quarter of the ground; that is, the roots of an acre of vines are confined to a quarter of an acre. Under these circumstances the roots must fill the border as those of a plant fill a pot, and the vines struggle one with another, and they are root pruned besides. The vines are not allowed to have their own way, and Mr. Moore had sometimes thought it desirable to let them have their own way a little. Mr. Barnett, however, must crowd and prune the roots of his vines because his border is so rich. Mr. Moore had never seen any variety of *Vitis Labrusca* grown in this way that did not lose its vigor. Perhaps under Mr. Barnett's system, when the roots are in the same condition as those of a pot-bound plant, it is necessary to make the border as rich as he does and the moist soil, which is not generally desirable for vines, might be proper where the roots of an acre of vines are confined to a quarter of an acre.

Any vine started at an angle with the ground can be easily laid down, whereas if grown upright it cannot be. Mr. Moore thought it would be necessary to lay down vines grown in such a rich border, and he asked if it would not be better to grow them so as not to need laying down. Although Mr. Barnett had a difference of two weeks in his favor, Mr. Moore found no difficulty in ripening wood. Vines grown in soil rich enough to produce from forty to fifty bushels of corn to the acre will ripen their wood, though larger than that which Mr. Barnett exhibited here.

Mr. Moore regarded the method of pruning as of very little consequence; one might be more convenient than another, but the object is to get grapes, and any method that would fill the trellis with short jointed, well ripened wood will effect this. He had tried many plans, including the renewal, under which you might succeed for a year or two. He thought it desirable to prune in the

fall, as the most convenient time, but having left two rows, and pruned them in March, he was surprised to find that they leaved out earlier than those pruned in the autumn. He did not agree with Mr. Hovey's view that when vines were pruned early the sap would accumulate in the buds and perfect them. He would raise well ripened wood and not lay it down.

Col. Wilder had said that however grape vines might escape in ordinary seasons, once in a while there would come a winter when they would be killed, and we should lay them down to insure against such seasons. This might be true from his stand-point, for his soil was rich and strong, and he did not get good grapes. His soil is well suited to pears, but not fit to grow grapes on, and Mr. Moore did not think his opinion on grapes as valuable as on pears.

Mr. Barnett had condemned the Croton, Allen's Hybrid, Iona, Agawam, and others, and Mr. Moore agreed with him; and though Mr. Barnett thought better of the Wilder, Delaware, etc., he wound up by recommending the Hartford, Concord, and Martha, for table, and the Ives and Clinton for wine. The Clinton can only be grown on long canes, and if Mr. Barnett followed up his system with the Concord, in a few years they would be a failure, for the base buds would all be leaf buds. Every one would agree with Mr. Barnett as to the necessity of sun on the border. Mr. Moore said he would rather grow grapes on a trellis than on stakes, but he had been forced to the conclusion that they would ripen a few days earlier on stakes, though the idea was expressed in books that they would ripen earlier when the vines were spread out on trellises. Mr. Barnett had quoted Du Breuil as authority, but the principles which he laid down applied only to the foreign grape, and no more to our native grapes than to a shrub oak. Dr. Warder, in editing the book, questioned many of the positions of Du Breuil.

Robert Manning said that Mr. Moore was mistaken as to the character of the soil where Mr. Wilder's grapes grew. It was true that most of the soil where his dwarf and other pear trees were planted was strong and moist, but the grapes grew on a slope facing the southwest, where the soil was warm and but moderately rich.

Charles M. Hovey thought Mr. Barnett's paper very good indeed. Outside of the regular cultivators of the grape there were

but few who know that the grape vine bears only on the young wood, and but once on the same wood, and not, like a pear tree, on the same branch or spur for an indefinite number of years. It is information on such points as this that we want. As grapes are commonly planted there is no need of the bed, but with Mr. Barnett's system there is. At Thomery, near Paris, bunches of the Golden Chasselas weighing about half a pound each are raised by the ton and sent to the Paris and London markets, where they have gained a high reputation.

The Thomery system is to plant the vine ten or more feet from the wall or trellis, and to lay the vine under the soil until it reaches the one or the other, thus supplying rooting surface, just as Mr. Barnett does by his system. It is nothing new. In cultivating the vine much depends on whether the object is grapes or wine. A depth of thirty inches is not extravagant when the vine roots are laid across the border as Mr. Barnett advises. We must guard against the extremes of heat and aridity. At Rochester last fall, he saw Catawbas in the grounds of Mr. Ericsson, where, under good common culture, he raised them in perfection, and he had a vineyard where he had raised fifty-two tons of Catawbas on thirteen acres of land; but perhaps the proximity to the lake made the climate more favorable. In every system we can avoid what is unprofitable and accept that which is suited to our needs. If we understand the principles of cultivation we shall succeed; if not we shall fail. We require all the sun heat we can get, and should prune so as to have as little two year old wood as possible, for that is useless except as an extension of the vine.

Josiah W. Talbot, being called on by the Chair, said that the question before us was of the profit we are to get from our vines. Mr. Moore's remarks corresponded exactly with the views of Dr. Fisher, of Fitchburg, who had been very successful in growing native grapes. Horace Eaton, who had taken the prizes at our exhibitions for Allen's Hybrid and grapes of similar character, raised them on a heavy clay soil, thoroughly underdrained. All the merit he claims is in the simplicity of his culture. He lets no vine grow above four feet high, and the same arms fruit for ten years. Mr. Blanchard, of East Stoughton, prunes on precisely the same system as Mr. Eaton, and raises bunches of a pound weight each. His method of pruning and training is the same as Mr. Eaton's; he raises two arms twenty inches from the ground and

each four feet long, the ends being pinched off. These arms are retained until old; four or five laterals are allowed to grow on each cane, making eight or ten in all. The laterals are pinched off a first and second time, and never get above eighteen inches long. He always saves the axillary bud, and sometimes two buds, as one may dry up. He lets only one bunch of fruit grow on the axillary bud and two on the other. After blooming he pinches off the superfluous clusters and the end of the shoot, always leaving one good leaf. He raises from twenty to twenty-five pounds of the handsomest fruit on each vine. His land is no better than is ordinarily planted with corn, and has not had manure enough to raise a good crop of corn. The shoot from the axillary bud makes the spur for the next year. He has never sheltered his grapes.

Mr. Talbot thought Mr. Moore right in regard to deep culture, and such were also Dr. Fisher's views. When Mr. Barnett's vine bed is filled level with the soil on each side, the roots will be fourteen inches below the surface, which is eight inches too deep. Mr. Blanchard says, "Never grow an inch of extra wood; throw the whole power of your vine into the fruit." No vine draws its nourishment two years from the same place. Too much power is wasted in growing extra wood. It is as easy to grow fruit as wood. Dr. Fisher raises a new arm every year, removing the old one, and this Mr. Talbot thought an instance of the waste of root power.

Henry F. French said the question was whether we should prune to close spurs or whether we should let our vines run more freely. Many persons who set their vines near together with the idea of pruning closely, had taken out half the number, to give the others more room. He questioned the possibility of pruning so as to throw what would otherwise be wood growth, into the fruit. It was curious to see how the same questions in horticulture came round in from twenty to fifty years. Mr. French here referred to a copy of "Cobbett's American Gardener," published in 1821, containing directions, with diagrams, for training and pruning the grape on the renewal system, with two growing and two fruiting branches trained horizontally on each side, each vine occupying sixteen feet of trellis. He said that when a boy, about fifty years ago, he cultivated Catawbas according to these directions, on the top of a hill in Chester, N. H., and they ripened two years out of three. He had no difficulty in getting plenty of fruit, though the

system required more care than spur pruning. The Isabella is still raised in Chester and sent to market; they escape frosts there. The Catawba ripened as early as the Isabella; they were never covered in winter and never killed.

Hervey Davis regretted that the essayist had not said more about varieties and culture for amateurs. He had grown grapes for fifteen or twenty years, and had never succeeded better than when he trained them on stakes; he thought they were then most easily pruned and best exposed to the sun and air. His plan was to take up three shoots to three stakes, and once in a few years, when they needed renewal, to take up a new one. He would lay down vines, and thought Mr. Moore might have saved his by covering.

Mr. Moore said that he had never lost any vines by the tops winter killing, but he had lost a solid half acre by the killing of the roots. He mulches them now with three or four inches of refuse bristles, and does not lose them. The temperature of the ground does not rise so high as if they were not mulched, but, to compensate, it never falls as low, and the mulching saves the trouble of weeding. He has one vineyard where there has not been a hoe, plough, or manure, for eight years, and it has continued to produce full crops of good fruit.

Mr. Davis remarked that while Mr. Barnett and Mr. Moore discarded the Iona, he had ripened it seven years out of eight, by covering the vines during winter with straw or hay. It had the same treatment as twelve other varieties that he cultivated.

The Chairman said all would agree that Mr. Barnett is a very careful observer. He thought his system excellent in many respects. Though the plan of crossing the roots and taking six canes up one post was, in his opinion, objectionable, these were not material parts of the system. There was no reason why we should train two canes on one rod, and with one tier above another the upper would be likely to shade the lower. He liked the plan of allowing the laterals to arch over, without tying, as it checked their growth and saved the need of so much pinching. The main point brought out by Mr. Barnett was admirable—the carrying the vines away from the roots, where they do not shade the ground. He approved of root pruning, if the roots were inclined to run under shade, and thought the pot-bound condition serviceable in producing fruitfulness; the roots are kept within bounds. He

had no doubt that when the Concord failed it was often caused by planting too thickly and shading the ground. Keeping the roots fully exposed to the sun is most important. He did not think that Mr. Moore's mulching hindered the ripening of the grapes.

Mr. Moore asked what would be the effect on a plant of being pot-bound for years.

The Chairman replied that it would need to be fed more liberally, and that was the reason why Mr. Barnett made his border so rich. If well drained no ill results would follow from depth of border.

Robert Watt asked whether failures did not arise from close root pruning. He thought they did, and also from not pruning the tops closely enough. He alluded to a grower in Philadelphia, who made a failure in growing grapes on the pot-bound system, and said he agreed with Mr. Moore on this point. He had taken up grape borders made with bones, horn piths, leather, etc., and never found a root that had taken hold of either until the bones were so decayed that they would crumble when rubbed in the hand.

Mr. Talbot remarked that Mr. Blanchard never laid down his Concord vines. Mr. Eaton always covered his Ionas and similar varieties.

James Cruickshanks said that those who had grown good fruit had found a gain of a fortnight by covering Isabellas.

Mr. Talbot said that vines should always be covered when the wood is not ripened. He thought it possible that the wood might ripen after covering.

Marshall P. Wilder differed from the last speaker in regard to the ripening of the wood after being laid down. The functions of the plant have ceased when the leaves have fallen, and there can be no further ripening of the wood. As to pot-bound plants, the Chinese will grow one in that condition for fifty years by proper feeding. He was pleased with the sound physiological principles laid down by Mr. Barnett, especially in regard to the exposure of the leaves to the sun. Mr. Barnett showed that the roots had been confined to the bed, where they had received constant nutrition. Mr. Wilder thought the two great points were confining the roots to a warm bed, and exposing the leaves to the sun. These principles are so sound that they need not be discussed. There is a difficulty, as Mr. Moore has said, in letting the roots run deep in a cold, wet border. This can only be remedied by thorough drainage, which is the first letter in the alphabet of good culture.

You might as well expect a man to thrive by eating a good dinner with his feet in ice-water, as a vine to thrive, though well manured, with its roots in a cold, wet soil.

Mr. Moore asked how a soil could be both warm and moist.

Mr. Wilder replied that he had a sand bed for striking cuttings, and this year he had in it much coarser sand than usual. The sand is moist, but warm, for the drainage is perfect, and his cuttings strike better than ever before.

The Chairman referred to Mr. Barnett's essay, and showed that he had spoken of a warm, dry soil, as well as a warm, moist soil, being required by the grape, and said that we must reconcile these statements as we best could. He thought that in providing such a depth of soil Mr. Barnett meant to have it moist.

Mr. French said that a thoroughly dried soil would absorb half its weight of water. Soil that is drained will hold more moisture than an undrained soil.

Mr. Moore asked, Is not the reason that Mr. Barnett wants a moist soil, that he has got an acre of vines on a quarter of an acre of ground?

Mr. French said you cannot heat water from the surface, and it is the same with soil. In a cold season the heat does not go down in an undrained soil as in one that is drained.

James Murray remarked that there were exceptions to all rules, and that he knew of a standard Lawrence pear tree which stood on the banks of the Charles river, with the roots not more than two feet above the level of high water, where the ground in spring is a perfect marsh This tree is every season loaded with the finest fruit, so as always to excite his astonishment, but he would not like to plant an orchard of pears on such soil.

Mr. Wilder added, as another apparent exception to a general rule, that though the Beurre Bosc is commonly supposed to require a warm soil, the tree which produces his best fruit of that variety stands in a low, wet soil, where hundreds of dollars worth of trees around it have been killed by standing water. Such instances, however, do not invalidate the general principle.

James Cruickshanks would let vines have all the rain, but it has generally been considered that dew is one of the worst things you can have on vines, causing mildew. William Saunders, of the Agricultural Department at Washington, furnished his trellises with copings to protect the native grapes from the fall of the dew.

Mr. Talbot said he had a Delaware vine in a cold grapery where it never had rain or dew, and it always bears fine fruit.

Mr. Moore said that where his vines were mulched the ground underneath was so full of roots that he could not plow it; they are within two inches of the surface. All he has to do is to tie up the vines and pick the fruit. No weeds grow there, and the mud does not spatter up on the fruit. He thought the *average* temperature of the soil was higher than when it was not mulched.

Mr. Talbot said the fact that the roots come so near the surface shows that they do not want to go deeper.

Mr. Wilder said we live at the northern limit of the grape region — almost at the jumping off place — and we cannot be certain of our crops without covering. He asked Mr. Moore whether he had had any vines split open by the cold, and said that he had already noticed trees cracked open by the cold in November and December, and he believed that in spring vegetation would be found much injured. It would save a great deal of trouble if we could keep our vines up all winter, but every few years we have a season which destroys all the wood, and the only sure way to prevent it is to cover every winter.

Mr. Moore said he had no more doubt than he had of his own existence, that on a warm, dry soil, with hardy varieties — not hybrids — vines would ripen their wood as certainly as apple trees. When vines are grown in rich soil and make coarse wood, laying down is the only way you can save them.

Mr. French thought this was a very important matter, and that if Mr. Moore had laid down the vines which were killed, he would not have lost them. He covered his every winter, and even the Isabellas were sure to live. By covering, you escape winter killing, which is nothing but the injury to unripe wood by changes of temperature.

Mr. Moore said that the tops of his vines were not winter killed, for cuttings from them grew, and the tops themselves grew two or three inches. Vines near by, which were mulched, were uninjured. Vines with the best ripened wood would be liable to be killed by the roots freezing, when the tops were not injured.

Mr. Wilder mentioned a case of injury to an orchard of dwarf Beurre d'Anjou pear trees, which he saw at Lockport, N. Y., by killing of the roots when the ground froze very deep. Another square of standards adjoining was uninjured.

Mr. Moore said that he had an Isabella vine split open, but he did not consider it a hardy grape and would not cultivate it. It must be laid down.

The Chairman remarked that we sometimes do have winters that kill the tops and do not kill the roots.

Mr. Talbot said that, though the commonly received idea was that plants were injured by freezing and thawing in sudden changes of temperature, the winter of 1874-5 was all freezing and no thawing, and plants never were so much injured.

Mr. Davis thought that covering the tops would also benefit the roots.

Mr. Talbot suggested the influence of the scion on the root as a subject for discussion at a future meeting.

Mr. Davis suggested the best varieties of fruit for cultivation.

The Chairman remarked that he had been asked whether these meetings were open to the public, and said that the Society, in seeking to diffuse information on horticulture, did not intend to confine it to the members alone, and that all interested in the subjects discussed would be welcomed.

MEETING FOR DISCUSSION.

SATURDAY, January 22, 1876.

E. S. Rand, Jr., made some remarks on a fine specimen of *Lælia anceps* exhibited by him. It is a most beautiful genus and this is one of the finest species. It is difficult to convey in words an idea of the beauty of the delicate rosy purple petals and the deep rich purple of the lip. The flowers are produced on long, slender, gracefully drooping stems. The plant had five spikes, bearing in all fourteen flowers. This species is a native of Mexico, and was introduced into England in 1833, but its wants were not understood, and for many years it was grown in a small and imperfect condition. The *Cattleyas* and *Lælias* are very closely allied, the only distinction being in the number of pollen masses, the former having four and the latter eight. In orchids the pollen is held under the column, and they require the agency of insects in fertilization. The flowers are very long lived; those on the plant

exhibited had been in bloom for three weeks, and would probably last two weeks longer. This long duration is due to the fact that they are not fertilized; like all other flowers, they decay immediately after fertilization. This plant began to throw up its flower spikes in August; they had at the termination protuberances which in November began to swell, and ultimately developed into flower buds. The genus is one of the easiest to grow; it can be cultivated in a common conservatory or greenhouse. West Indian and Mexican orchids dwindled and died under the treatment formerly given them under the misapprehension that they required the same culture as the East Indian species. *Lælias* require in summer only the ordinary temperature of a greenhouse, which in winter may be allowed to fall to 45°. The plant is of elegant habit with shining, dark green leaves, from one to three of which are produced on each pseudobulb. Immediately after the flowers have faded the roots will begin to protrude. An orchid will grow indefinitely in one direction if allowed, and the object of the cultivator is to produce "back breaks."

Mr. Rand said that he had been looking into the prices of orchids to ascertain whether they were a profitable investment from a pecuniary point of view, and had come to the conclusion that they were. In England, single plants had sold as high as two hundred and fifty guineas, though good specimens could be obtained at reasonable prices; that exhibited cost twenty-five dollars two years ago, and is probably worth three times as much now. Like pictures by the old masters, a fine specimen will always bring a good price. The colors of the *Lælias* are white, purple, and pink in different shades, and there is not a poor species in the genus. He knew of no plant more desirable for cultivation, either by amateurs or for the sale of the flowers. He expected next Saturday to bring in a plant with a hundred flowers.

In answer to an inquiry, Mr. Rand said that back breaks were made by cutting the running stalk about three-quarters through, when a little bud would form at the base, which is afterwards separated. This is the method adopted by nurserymen for propagating. Another species is *Lælia albida*, with white, fragrant flowers. Mr. Rand had received from Hugh Low & Co., Upper Clapton, England, ten plants of this species, the whole of which would not fill an eight-inch pot.

Hybridization is easily effected; the method is to lift up the top

of the column, and with a pair of pincers place the pollen masses on the stigma, when it instantly disappears. The orchids which have been most extensively fertilized in cultivation, are *Cypripedium*, *Calanthe*, and *Vanilla*. The fruit of the last has been produced in considerable quantity at Kew Garden.

Mr. Rand had had some of his orchids fertilized, probably by insects getting into the house, as very few fructify themselves. The *Lælia* exhibited would require more moisture than is ordinarily found in the air of a greenhouse. The best plan would be to separate a portion of the greenhouse by a glass partition. His orchid house, although but twenty-five feet square, contained two hundred and fifty species.

Mr. Rand also exhibited a plant of *Cirrhopetalum Medusæ*, the generic name of which is derived from *kirros*, tawny, and *petalon*, a petal. The flowers are small, but so numerous in the spike, and two of the three sepals are so very much lengthened, as to give the spike the appearance of a head with long, dishevelled hair, whence the specific name. The bud comes up in a small sheath like the bud of a pink, and the flowers are twisted up very tightly. Being a native of Singapore it requires a great deal of heat and moisture. All orchids require good drainage and are impatient of sour soil.

MEETING FOR DISCUSSION.

SATURDAY, January 29, 1876.

The chair was filled by William C. Strong, Chairman of the Committee on Publication and Discussion, and the following paper on Wardian Cases was read by the writer.

WARDIAN CASES AND FERNERIES. I.

BY W. H. HALLIDAY.

Every one should have a hobby, says Prime in his preface to "I Go a Fishing." Mine has been, for a dozen years, Wardian Cases and Ferneries.

How I came by this hobby I am here at this time to tell you. Several years ago, looking over some books on floriculture, I came

across, in a volume then recently published, the engraving of a Wardian case. The description of this seemed to suit my fancy, as I wished to grow some plants during the winter months, and my former efforts in that direction had not been attended with very marked success. This seemed to promise better things, and I determined to give it a trial. The case I soon constructed, in the intervals of business, according to the book. This was my first attempt. I have had many more elaborate and beautiful ones since then, but this was the pet—the initial point, from which I have received so much horticultural pleasure.

Many articles have been written on this subject, by eminent English cultivators within four or five years, and it is now comparatively easy for a novice to gain all the information required, provided he has determination enough for any undertaking that will bring an occasional disappointment. But the chances of failure are so small, when one has started in the right direction, and the satisfaction of growing, in your own home, plants whose delicate forms and beautifully marked foliage are a wonder even in a greenhouse, is so great that it is surprising to me that all lovers of plants do not possess one of these little tropical gardens instead of the long drawn, sickly looking plants we see at windows, as we pass along our streets, that cost so much time and trouble in their cultivation. A well grown plant of *Maranta zebrina* is in itself a perfect picture of form and color, and the easiest thing in the world to grow in a Wardian case under proper conditions. Years ago there was a case with a plant of this kind in a window at the South End. The plant filled nearly the whole case, and looked so fresh and bright on a winter morning, that it always compelled me to stop and admire its beautiful foliage.

I propose in this article, not to deal in generalities, but to give, as nearly as my recollection will permit, a description of some of the cases I have had, with the plants grown in them, and my successes and failures during all these years, mentioning only the names of plants which I have actually tested.

I had two large windows facing the south, but a building obscured the rays of the sun part of the time. In the windows I placed two cases, each forty inches long, by eighteen inches wide; the box was six inches deep with an inner box fitting loosely to receive the soil; an inch moulding fitted around, projecting half an inch above the box, to receive the sash. The sash was on two

sides fourteen inches high, the ends solid, and the inside faced with mirrors. You will readily see that I introduced the mirrors to double the effect, and render the whole more beautiful. Upon this sash was a top ten inches high, sloping on the two sides, which fitted to and was kept in place by an inch moulding. This top could be removed to reach the plants, or tilted up a little if ventilation was desired. One of these cases I devoted to native plants, the other to exotics. I made many trips to the woods and my case of natives was soon in a prosperous condition. I filled it with all sorts of plants that happened in my way, among which I remember the blood-root, hepatica, trailing arbutus, pitcher-plant, lycopodium, *Mitchella repens*, *Polypodium vulgare*, and *Adiantum pedatum*. All these did remarkably well, but I found when winter came that many of them dropped off to sleep, and the curtain fell for the season.

In the centre of the tropical case a *Dieffenbachia picta* was planted; in one end *Maranta zebrina*, and at the other, *Ananassa sativa var.* These three plants, with some lycopodium and a few small ferns, soon filled the case, and it was quite successful. Some of the smaller plants had to be removed, as they did not thrive with the others. By the end of the summer the *Maranta* had quite outgrown its quarters, and had to be replaced with a smaller plant, and the same was the case with the *Dieffenbachia*. The latter seemed quite at home, each new leaf as it appeared becoming more beautiful, till the white spots had nearly crowded out the green, making a fine contrast with the *Maranta* on one side and the *Ananassa* on the other. This plant (*Dieffenbachia picta*) has never failed me, and I deem it one of the very best case plants. I noticed particularly the peculiar marking of the foliage coming out much more distinctly and beautifully than in a greenhouse. I cut this down when it had grown so large as to crowd the case, making a new plant from the top. The *Ananassa* proved itself a valuable acquisition, coming out in a beautiful rosy pink—a perfect blaze of color. This was more distinct and brighter than I have ever seen it since. As the winter approached, bringing its season of rest, the color faded to its ordinary hue. The next spring it again started with its rosy tint, and during the season fruited, and that was the end of it.

Having had such good success with these cases, I thought I would try one on a larger scale. The plan was soon in the hands

of the cabinet-maker, and in due time, made and set up in its allotted place. This was made very large, for an experimental case. Many of you will remember it, as it was exhibited in this hall four or five years ago, at the Annual Exhibition. It was nearly four feet square and stood six feet high from the floor to the top of the roof. The box stood two feet high, set on heavy casters, and moving on a pivot, so that it could be readily turned to the light as the plants required. The inner box was half an inch smaller than the outside all round, eleven inches deep, thoroughly covered with white lead paint, and perforated through the bottom with inch holes for drainage. The glass case, thirty inches high, fitted into a moulding projecting above and around the top of the box. The sash was made very strong, with iron braces set into each corner. Each of the four sides consisted of two panes of glass, two panes on two sides serving as doors. The roof was formed of four sloping sides, surmounted by a flat cap of wood, twelve inches square, tapering upward, with a turned point twelve inches high. This cap fitted on like a cover, and could be easily removed if necessary. The case was thoroughly painted with three coats of white lead, and cost, when completed, seventy dollars. It was as tight as ordinary fitting would make it, and in this condition was first planted. It stood before a large south window, receiving the sun several hours each day. In the bottom of the soil box, I placed small pieces of charcoal two inches deep; this was lightly covered with old moss to keep the drainage free; then I filled up the box with a compost of peat, loam, and sand. To give the case color, I placed in the centre a large plant of *Dracœna terminalis*, and near it good sized plants of *Pteris argyræa*, *Pteris tremula*, *Pandanus Javanicus var.*, *Maranta zebrina*, *Maranta sanguinea*, *Dieffenbachia picta*, and *Sanseviera Zeylanica*. This last named plant, I think, was the first one of the kind brought to this city. Two plants were given me by Mr. Irving, then gardener to Mr. Van Vorst, of Jersey City. The other plant I gave to the Botanic Garden. Mr. Irving also gave me a large plant of *Pothos argyræa*, which was trained up the sash and made a fine growth. A few small ferns and lycopods were put in to fill up the spaces near the glass. Altogether, the case made a fine appearance when planted, the color, form of foliage, and habit of the plants blending and harmonizing well together.

But after a while, the case did not work as well as I expected. The *Dracæna* grew brown on the ends of the leaves, and gradually the whole leaf decayed. The ferns did not do well at all, but damped off till I grew quite discouraged. I continued to replace the decayed plants by others, with no better results. I thought the trouble might be caused by want of heat, as the room at night and on Sundays, when I was not on hand to look after the fires, might become quite cool. With this thought came the idea of heating the case. I had made at the tinman's a small boiler holding a gallon of water; behind the case near the floor, I placed a gas jet, and over this the boiler, removing a panel from the box of the case, then fitting it so that it could be opened or closed at pleasure. The inner box, containing the soil, being eleven inches deep, left a space of twelve inches underneath; in this space I placed tubing enough to extend completely round the case, and to connect with the boiler outside. All seemed to work like a charm; a regular flow of hot water circulated through the case, but the gas was uncertain, having a strong inclination to go out occasionally, leaving a leaking burner so near the case that the plants suffered from it; consequently this was abandoned. I then went to work to ventilate the case, giving a little air at a time, till at last I removed the square of wood from the roof, and replaced it with a piece of plate glass, which I could remove wholly or in part, and this, with the aid of the panel which was opened for heat, furnished the means for ventilation. I soon saw that it was the one thing needed; everything worked well from this time. Occasionally a plant would become unsightly, and have to be removed; but on the whole it was a success. *Maranta sanguinea* became a beautiful plant; *Dieffenbachia picta*, a wonder in color; *Maranta zebrina* grew luxuriantly, its large velvety leaves attracting all who came into the room. *Sanseviera Zeylanica* made considerable growth, sending up several new shoots. *Pandanus Javanicus* did well through the summer and autumn, but damped off considerably in winter. My success with ferns was not so marked as in smaller cases by themselves.

The experience with this case convinced me that Wardian cases should be treated as miniature greenhouses, and that close cases might answer for some plants, but not as a rule to be generally followed. I have made many cases since this, and always constructed them on this principle. I would not accept a case as

a gift, unless it was properly drained and ventilated. I should feel quite sure of losing some valuable plant that might cause more annoyance than the expense of a case properly constructed. I do not think the shape matters much, so long as it suits the possessor, but a medium size is better than a small one, and easier to manage than a large one. Twenty inches by thirty, I think a very good size; not too large for most rooms, and large enough to grow good sized plants. The case I last exhibited here is of that size, and is my *beau ideal* of a perfect Wardian case. It is constructed of the best seasoned material, and though it was made nearly two years ago, and has since been in almost constant use, all the joints are as perfect as when it came from the cabinet-maker.

The following are the dimensions of this Wardian case: depth of table seven inches, made with an outside moulding to receive the sash. The turned legs are so morticed into the box that they are perfectly solid, and fastened *into* brass casters — the only proper way of putting on casters. The table, with the casters, stands twenty-eight inches high; a zinc lining closely fits the box, forming a lip round the moulding to receive the sash. This prevents water that happens to drip from the glass, or when watering the case, from coming in contact with the wood. A zinc tube passes through the bottom of the case for the purpose of drainage; within this, and less all around by a quarter of an inch, so that it can be easily removed, is a wooden box of half-inch stuff, also lined with zinc and perforated through the bottom with an inch hole. Across the outside of the bottom, on either end is a narrow cleat half an inch thick, so that the water in passing through can find ready means of escape through the tube. The sash has a circular top, the extreme height, thirty-three inches, coming on the side, instead of the end, producing a fine effect when the case is filled with plants. Each end of the top forms a quarter circle, which is hinged from the top bar, and can be opened to reach the plants, or to increase the ventilation. The corners of the sash are firmly secured with brass braces, so that no amount of dampness will affect it. In the bottom bar of each sash is fixed a slide five inches long by one inch wide, which can be readily opened when ventilation is necessary. There are six half-inch holes in the top bar, which are never closed. The method of draining this case was the same as that of the other.

For soil, I prefer good leaf-mould, mixed with sand. Masons'

sand is best, as it is coarser than the sand generally used, and it is more easily obtained. I use one-third sand and two-thirds leaf-mould, adding a small quantity of fine charcoal. I add the charcoal to keep the soil light and sweet. Peat is generally recommended for cases, but a good quality of peat is difficult to obtain, the article usually found being not much better than muck. George Such, of South Amboy, N. J., has the best, but it is not always easy to obtain it from him. My rule is, to mix the sand, leaf-mould, and charcoal together with water, wetting them thoroughly, but not so as to cause the mixture to adhere to the hand. When this is done the case is ready to receive the plants.

This case pleased me best when it was planted in the following manner: *Nephrolepis exaltata*, with its long, slender fronds occupied the centre, and around it were ranged in order *Pteris argyræa*, *Maranta pulchella*, and *Adiantum colpodes*. This last is truly a beautiful plant for the place, its long slender fronds giving it a fairy-like appearance, and imparting grace and beauty to the whole collection. A fine plant of *Adiantum formosum* stood opposite *A. colpodes*, its fine fronds shooting above those around it, rendering it conspicuous, and contrasting finely with the silver *Pteris* and the more rigidly exalted *Nephrolepis*. A good sized plant of *Fittonia Pearcei*, with its fine crimson markings, gave color on one side, while its silver leafed brother, *F. argyroneura*, was equally effective on the other. Besides these there were *Adiantum cuneatum*, also a good plant; *Onychium Japonicum*, when well grown, surpassed by few ferns in beauty, and eminently fitted for the place; *Selaginella Wildenovii*, one of the best of its kind; *S. stolonifera*, also a good case plant; *Maranta pulchella*, better than *M. zebrina* for a medium sized case, being dwarf in its habit, though not so finely marked, but forming a charming contrast to the delicate ferns. This made eleven plants in all—just enough to fill the entire case, while every plant showed its own peculiar form and character, and did not appear at all crowded. The tendency is generally to put in too many plants, giving the whole a heavy and unsightly appearance. The majority of people do not consider a case well filled unless it is crowded, but I think the grace that comes of lightness and individuality is much more attractive. In describing the position of the plants, I forgot to mention the cocoa-nut shell suspended from the top, containing *Adiantum setulosum*, giving completeness to the whole.

I have another case of smaller size, twenty-two inches by fourteen, convenient and not expensive, to be placed on a stand. This, in its general characteristics, resembles the larger one just described, having provision for complete ventilation and drainage, and when filled with the following named plants, makes a charming appearance: *Maranta pulchella*, *Adiantum cuneatum*, *A. setulosum*, *Pteris argyræa*, *Onychium Japonicum*, *Selaginella Wildenovii*, *S. Stolonifera*, *Fittonia Pearcei*, and *Latania Borbonica*. These plants were taken from three and four inch pots, and were quite large enough to commence growth in their new home.

MANAGEMENT OF WARDIAN CASES.—This is the stumbling block which many find in the way; yet it is a very simple thing, provided the case is started rightly, with the kinds of plants suited to the season, and the position you intend the case to occupy.

We will here consider a case for winter decoration of a sitting room, which we will suppose to be warm enough for comfort during the day, and the fire not allowed to go wholly out during the night. We will suppose the case to have been planted as early as the first of September, so that the plants have had time to make considerable growth before the cold weather commences. All cases ought to be planted as early as this for the winter. It is generally supposed that Wardian cases require very little light; on the contrary, they need an abundance of it, but not necessarily the bright sunlight. Place the case directly in front of a window. I should prefer an eastern or southern exposure, as the sunlight is hardly powerful enough during the short winter days to harm the plants. We are now speaking of a ventilated case. When the case is exposed to the sun the ventilators should be open. Water should be given sparingly all through the winter. For this medium sized case (twenty inches by thirty), if in a warm southern exposure, use half a gallon of tepid water, once a month. If it has less heat and sunlight it will be necessary to give only half this quantity.

Be sure the soil is never muddy or pasty. If in this condition you will soon lose your plants. Look over the plants every three or four weeks, removing all unsightly or decaying foliage, and look carefully after the brown scale. This little pest has a particular fondness for some of our choicest ferns, and would soon render them unsightly if not removed. The slug is another source of annoyance, but watchfulness will soon discover the thief. We are almost certain to find him during the day under cover of some

leaf, coming out only at night, or during dark days. Some cultivators advise thoroughly saturating the soil with boiling water before planting the case, thereby destroying all insect growth. I have never resorted to this expedient, but think it would be advisable to do so.

In conclusion, to be successful in the management of our *winter garden* (which I think is a more suitable term than Wardian case), give plenty of light and heat during the day, the mercury ranging from 60° upwards, and not falling below 40° during the night; ventilate an hour or more each day, and do not give too much water, having it warm when applied. Much more might be said on this subject if time would allow, and other examples might be given of cases planted for summer culture. There is also much to be said about the arrangement and management of Ferneries which I hope to give at some time not far distant.

Discussion.

C. M. Hovey said that Mr. Halliday's paper was so full that it was, perhaps, hardly worth while to go over the ground again. As he says, the general management, in regard to air, watering, light, etc., is of the highest importance. The question is often asked of dealers, by purchasers of plants, how often to water. Beginners frequently water plants too little, merely sprinkling the surface of the ground, and the plants damp off, not from too much moisture, but from dryness; the collar, which should be dry is kept wet. Mr. Hovey hoped that Mr. Halliday's paper would lead to the cultivation of the plants which he recommended. A mistake made by novices in planting Wardian cases is to want them as full at the start as they should be after six months' growth. They want to see the ground covered immediately. Mr. Hovey said that he had read nearly everything that had been published on Wardian cases, and that this essay of Mr. Halliday's showed his familiarity with the subject.

The Chairman remarked that there were many beautiful plants and flowers on exhibition; among others, some forced lilacs, in regard to which the question had been raised whether or not they were the Persian lilac.

Mr. Hovey said that they were either the old lilac or some hybrid, and not the Persian. Mr. Calder who brought those ex-

hibited, had three rows in his forcing house. There is a great demand for forced lilac flowers. In Paris it is considered difficult to produce them, and the same with the lily of the valley. Lilacs require a very high temperature and darkness to bring them out early.

The Chairman said there were on the table some leaves of the white spotted *Richardia*, and asked whether it flowered as freely as the plain variety, commonly known as the calla.

Mr. Hovey had not found it as vigorous and productive of flowers as the common calla. It was valuable for planting out as a variegated foliage plant in summer. It was a summer bloomer, though not generally known as such. It might be taken up in autumn and treated like the dahlia, or it could be kept on growing in the greenhouse.

John B. Moore, who exhibited the *Richardia*, said that the flowers were about half as large as those of the common species, with purple centres. Reasonably strong bulbs grew pretty well with him. He was not aware that it was a summer bloomer, and had treated it just as he would a common calla, and they flowered freely. He turned them out of the pots and planted in a dry soil in the garden, and thought they did better than when dried in the pot.

Mr. Hovey said that the spotted variety has a greater tendency to rest than the plain. Like many other bulbs, it may either be kept in bloom or dried off.

Edward S. Rand, Jr. was called on for some information concerning the orchids exhibited by himself and others. The first of these was *Cattleya amethystoglossa*, and Mr. Rand said that this genus is one of the easiest grown, while the flowers are of brilliant color, many of them delightfully fragrant, and the plants of neat and compact habit. The species on exhibition is probably of Brazilian origin and had never before been shown here. It sends up a flower spike two feet or more in height; the flowers are large, of a rosy purple, spotted with dark purple and the lip of the same color. The culture which it requires is to have heat while in growth, to be kept rather dry, and to avoid wetting the leaves, never syringing. *Saccolabium giganteum*, an East Indian species, was also exhibited by Mr. Rand, the plant having two of its dense,

drooping spikes of flowers, like beautiful wreaths. It had been in bloom for ten weeks, having begun about Thanksgiving time. The flowers are deliciously fragrant. The plants may be brought into the house for decorating the hall or parlor, without injury. They have no fleshy pseudobulb, and must never be allowed to dry up, but require similar treatment to that of the *Vandas* and *Aerides*.

A fine plant of *Cymbidium aloefolium* was exhibited by James Comley. This is one of the oldest orchids in cultivation, having been introduced from the East Indies in 1790. The *Cymbidiums* are a very free flowering genus; this species is sometimes fragrant. Some of the species are very rare and costly, a hundred guineas having been paid in England for *C. eburneum*. Some cut spikes of *Dendrobium nobile* were also shown by Mr. Comley. This can easily be grown in the warm end of a greenhouse, where it will produce flowers by the hundred. The mode of propagation is to lay the stems in the warm, moist moss. Young plants will then form on the stems and can be separated and potted; indeed, they will often form on the stems when not laid down. It is also easily propagated by division. Mr. Rand said that he had propagated twenty or thirty in this way. He had seen single plants producing a thousand flowers each.

A. P. Calder, who exhibited the forced lilacs, having come in, was asked to give some information as to the variety and culture.

Mr. Calder said that the flowers were all the common purple lilac. Some of the bushes had been growing in his father's yard twelve or fifteen years. He planted them on the benches in the forcing house, some in the sun and some in the shade, just as it happened. The shade makes some difference in the size and shape of the flowers, but not in the color—more in the shape than in the size. Some have full formed flowers, while others have the lobes of the corolla narrow; the latter grew in the shade. Mr. Calder said he gave them a good deal of heat; they must have steady heat—if it falls they become checked and dwarfed. They must also have plenty of moisture. These plants were dug up at Christmas time and planted on the bench a week after. Last spring, after the frost came out and the lilacs began to start, he took up a plant and placed in heat, and in three days the flowers began to open. The color changed like that of the flowers exhibited, and the change was in both cases caused wholly by forcing.

Mr. Hovey said, in regard to time, that it had been stated that a certain amount of heat is necessary for the germination of seed, and if you distribute that amount over a long time you get no more result than if the same amount is applied in a few days. The lilac out doors begins to start about the first of April, and flowers about the first of June, requiring sixty days. Lilacs placed in a temperature of from 50° to 70° remained in the same condition for a long period. The effect of ordinary temperature is nothing, but 75 to 80° bottom heat, and a higher air temperature, would start the growth, and a decline would check it. It is the same with the lily of the valley; if once checked they cannot be started again. A temperature of 60° for thirty days makes a total of 1800°, and if you can give this amount in less time you will produce the same effect.

Marshall P. Wilder agreed with Mr. Hovey in his ideas of heat, and asked what was the shortest time in which he had known cuttings to root.

Mr. Hovey said that he had placed verbena cuttings in wet sand in a temperature of 80° or 90°, and they rooted immediately—certainly by the next morning.

Mr. Wilder said that he had rooted verbena cuttings handsomely in thirty-six hours, soon after hot water was first introduced for propagating beds, but not many plants root so easily.

The Chairman asked whether the time would not depend somewhat on the condition of the cuttings.

Mr. Rand said that he had rooted verbena cuttings so as to be fit to pot in three days, but, though this might be done in April, in autumn it would require thirty days. The lilac is grown in Paris in underground pits, in a great deal of heat. If we have two warm days successively in winter, newspaper editors immediately write on the danger of injury to the buds of trees, and friends are sure to bring in some swollen lilac buds. The lilac makes all its growth by the first of July, after which the buds for the next year's growth form and do not begin to grow until spring, but when we have two or three warm days in winter, the scales will swell and the buds show a lighter color. When it becomes cold again the buds return to their former condition. Plants know too much to put out before spring. There is no record of injury to plants before the first of March, but if we have a long spell of warm weather after that time, succeeded by severe cold, there is great

danger of injury. Mr. Rand thought the present winter, with the ground bare of snow thus far, would be hard on herbaceous plants. Many of that class which are tender here are hardy in Canada, where the ground is covered with snow. Alpine plants, which bloom on the edge of a snow bank, as soon as the snow has melted away from them, are destroyed in more southern climates, where they have not the protection of the snow.

Mr. Buswell asked whether the color of other flowers is affected like that of the lilac by forcing.

Mr. Hovey said the days were six hours shorter when these lilacs were forced than at the season when they bloom naturally, and in ten days they would then have sixty hours more sunshine than at this period of the year. They have not time to get their color in these short, dark days, but if grown slowly and if plenty of air were given, they would soon have more or less color. The same effect is produced by forcing on other plants; the Bon Celine rose, for instance, which, when forced at Christmas under a high temperature is almost colorless, or at least very pale compared with its brilliant tint in summer.

Mr. Wilder said that the whiteness of forced plants is owing to the absence of light, as in the shoots of a potato grown in a dark cellar.

Mr. Buswell remarked that the foliage of the lilacs on exhibition was of nearly as good color as if grown in the open air, and wished to know why that should not be affected as well as the flowers.

The Chairman said that these were not healthy and normal growths; the flowers did not draw their strength from the soil. The flowers resembled the Persian species.

Mr. Calder said that the lilac made no roots whatever in forcing, and more than two-thirds of the plants died after forcing.

Mr. Rand thought the plants died after forcing because no care was taken of them.

Mr. Calder replied that last year, after forcing, he transplanted nearly all his lilacs into the carnation house, and afterwards into the open ground, but the great majority died.

The Chairman thought the lilacs were like hyacinths and other bulbs that had been forced in water, sufficient vitality having been stored up in the plant to develop the flowers under a favoring atmosphere.

Mr. Hovey had never found any exhaustion of hyacinths by ordinary forcing. They would grow well enough but not flower,

except when they had been forced in a high temperature, when there was exhaustion because the foliage was not perfected. He thought that if Mr. Calder could place his lilacs, after a due season of rest, in a higher temperature than that in which they had been forced, he could excite them to growth. Plants after re-potting should be put into a bottom heat, and moderately watered and shaded to cause them to make roots. Plants are not exhausted by flowering, but by the high temperature, and it is so with the lily of the valley; he had planted them out, but found it difficult to get a healthy growth.

C. M. Atkinson said that in 1850 he succeeded Oldaker, who had been for twenty-five years gardener at Lord Sefton's, where they forced lilacs, cabbage roses, Anna Boleyn and pheasant-eyed pinks, etc. These lilacs had been there ever since Oldaker's time; some of them were grafted on ash and some on privet. They were forced by plunging in a mixture of fermenting material, and after forcing the old wood was cut back and they were planted out. If plants are cared for after forcing they can be preserved for many years.

The Chairman remarked that Mr. Hovey had said that the distribution of heat over a longer or shorter time in growing a plant made no difference, and asked whether the lilac flowers on the table indicated natural growth drawn from the soil, or from strength stored up in the plant and unnaturally developed.

Mr. Atkinson thought it difficult to answer this question decisively, but four weeks seemed to him a very short time to force lilacs into bloom. The French dig up large plants and force without foliage, and one would think this would injure them, but they renew their strength so as to force them again the third year.

Mr. Hovey read from the "Gardener's Chronicle," for January 8, 1876, an account of some experiments by M. Alphonse de Candolle, on the amount of heat required for the germination of seeds. "Mustard (*Sinapis alba*), germinated below 32° on the seventeenth day, and it is probable that this minimum might have been reduced still lower if it had been possible to keep liquid water around the seeds at 31.1° or 30.2°. Between 32° and 41° and 51°, each degree greatly accelerated the germination of *Sinapis*. Thus at 35.6° fifteen days elapsed; at 39.2° nine days. Afterwards the advance was more regular, but the rate of progress decreased gradually with each increment of temperature. Between 54°

and 68° the seeds invariably came up the second day. At 69.8° germination took place in less than a day — twenty-two hours. This was the most rapid rate reached. At 77° the rate slightly diminished, and at 82.4° only a small proportion of the seeds sprouted, and those at the end of the third day. At 104° not a single seed germinated.

The lowest temperature at which the seed of the Cantaloup melon germinated, was about 61.5° to 62.5°, more than nine days being required at this heat. From 66° the period was nearly uniform up to 75°, being three days. From 77° to 82.5° it slightly increased, as the seeds did not germinate till the fourth day, and this period was maintained with little variation up to 104°. At 105° one seed came up in ninety-four hours, that is, four days less two hours." The mustard and melon were quoted as examples of plants requiring, one a low, and the other a high temperature.

"Many other species tried, exhibited the same rapid increase at first, then uniformity during a long series of augmentations of temperature, succeeded by longer periods until the upper limit was reached. The seeds of *Collomia coccinea* offered a curious exception. They will germinate between 41° and 43°, but not readily except between the narrow range of 48° to 62°. Above this the heat becomes injurious to the species, and at 70° it took twenty-seven days, and with a greater heat the seeds did not germinate at all."

Mr. Hovey thought this statement a most interesting one. California seeds do not generally come up except in a temperature of about 43°, and at a few degrees above or below that point they do not germinate freely, corroborating the statement as regards the *Collomia*. He thought the principle established by these experiments would apply to plants as well as to seeds. If azaleas were placed in a temperature of 40° they would show no movement, but plants in a heat of from 65° to 80° had already done blooming. You will find that the amount of the temperature above 32° will produce nearly the same effect whether applied in two weeks, or distributed over two months.

The Chairman said that, admitting the correctness of Mr. Hovey's concluding statement, the important question is whether it is all the same to the plant.

James Cruickshanks related an instance which came under his observation in England, where a gentlemen was about to give a

large party, for which he wanted a quantity of mustard and cress. Two seed pans were sown at night and placed on the flue; in the morning the seeds were all started, and at night they had as much of each as was required.

C. H. Brackett was called on to give an account of his method of raising mushrooms, of which he had a fine dish on exhibition. He said that he had had good luck and did not expect to do so well again. He followed the directions given by Peter Henderson in his "Gardening for Profit," except that he did not cover with straw. He tried covering at first, but found that, in gathering, it disturbed the mushrooms. His beds had not been lower than 60° at night. Last year he attempted to raise them in a much higher temperature, and got but few.

Mr. Hovey said that here was another point in relation to temperature. He had also a dish of mushrooms on exhibition which had been raised in a temperature of from 40° to 45°. If they had had as much heat as Mr. Brackett's they would have been gathered by the bushel instead of the dozen, weeks ago. The bed was spawned October 2d; since then a new boiler, affording more heat, had been put into the house, and after that the mushrooms began to make their appearance. This confirmed the principle to which he had alluded. The more you force a plant the more you injure it for future usefulness. The lilacs mentioned by Mr. Atkinson were in pots, and not dug up from the open ground. He had forced the same deutzia plants successfully for seven years in succession, but not in a high temperature. The principle applies not only to the undeveloped plant in the seed, but through the whole of its life.

James Comley was asked to give his experience in raising mushrooms. He thought 60° to 70° the best temperature, with a bottom heat of 65°. A good bed, well made, would last about six weeks, but he thought them very uncertain. He had succeeded only two years out of five. His failures were sometimes owing to having poor spawn; he had had the beds a mass of spawn, but the mushrooms would not come for months. Last year he had four beds, each six feet by forty, and no mushrooms; other years he had got three hundred dollars' worth. He used to be troubled a great deal with insects, but watering with a weak solution of saltpetre would destroy them.

Mr. Hovey said the mushroom was "miffy." Fungi would grow under certain conditions, but within very narrow limits as to heat and cold, moisture and dryness. They will do pretty much as they have a mind to. If you can get the right kind of manure there is no need of spawn. He knew a gentleman who had fine crops produced spontaneously; the experiment was tried in the barn cellar, but one night the window was accidentally left open, and the temperature fell to 35° and killed all the spawn. Mr. Hovey said that he had raised mushrooms for six or seven years, and never failed to have a larger or smaller crop. His first attempt was most successful, as he had that year a large quantity of manure in good condition, from a large stable, which was much better than when only a small quantity could be collected at a time. Mushrooms cannot be raised very successfully in summer on account of the maggot; no insect troubles them in winter, but they are often eaten by the slug. He did not consider it on the whole a profitable crop.

BUSINESS MEETING.

SATURDAY, February 5, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President C. O. Whitmore in the chair.

The Recording Secretary reported that the notice of election of Recording Secretary, ordered for to-day, had been omitted by one of the papers, and that therefore no election could be legally holden to-day.

On motion of E. S. Rand, Jr., it was

Voted, That the Recording Secretary be ordered to give notice of an election of Recording Secretary for Saturday, March 4th.

The Committee appointed Dec. 19th, 1874, to obtain a portrait of the President elect, Francis Parkman, reported as follows:

"That exercising the discretion given them by the vote, they decided to obtain a bust rather than an oil painting, and accordingly gave the commission to Martin Milmore. The result of his

work is now here, awaiting your acceptance. Your Committee desire to congratulate the Society on possessing so faithful a memorial of a gentleman whose merit as a historian is known to thousands who are unaware of his valuable services to this Society, which are in this manner acknowledged.

C. O. Whitmore,
E. W. Buswell,
William Gray, Jr., } *Committee.*"

Charles M. Hovey announced to the Society the decease of George W. Pratt, and offered the following resolutions:

The Massachusetts Horticultural Society having learned with deep regret of the decease of their late member, George W. Pratt, it is hereby

Resolved, That in his death the Society has lost one of its original and oldest members, who not only was highly instrumental in perfecting its organization, but continued for a long period to act in various important official capacities, and particularly in the labor of inaugurating Mount Auburn Cemetery.

Resolved, That by the example of his personal efforts in the cause of horticulture, in the introduction, cultivation, and exhibition of new plants for many years, he has left a record honorable to himself and to our Society.

Resolved, That we tender to the family of the deceased our sympathy in their great bereavement.

Resolved, That these resolutions be entered upon the records and a copy sent to the family of the deceased.

Marshall P. Wilder, in seconding the resolutions, said that in the death of Mr. Pratt we had the satisfaction of knowing that he was not taken away prematurely, but like a shock of corn ripe for the garner. He was naturally a lover of the fine arts, inheriting his taste for horticulture from his father, whose garden, containing Brown Beurre and other pear trees, which would be recollected by many, was on the corner of Milk and Pearl streets, adjoining the mansion, which was afterwards the Pearl Street House.

Mr. Hovey said that Mr. Pratt was the first person to cultivate the dahlia in this country, when it was introduced in its single form.

The resolutions were unanimously adopted.

The Executive Committee, to whom was referred the resignation of Edward S. Rand, Jr., from the Committee on Publication and Discussion, reported, recommending its acceptance.

On motion, William C. Strong, D. T. Curtis, and Benjamin G. Smith were appointed a committee to nominate a candidate to fill the vacancy. The Committee reported the name of Rev. A. B. Muzzey, and he was accordingly elected.

N. P. Russell, of Boston,
Mrs. S. A. Holt, of Winchester,

being recommended to the Society for membership by the Executive Committee, were on ballot elected.

Adjourned to Saturday, March 4.

MEETING FOR DISCUSSION.

A meeting for discussion was held immediately after the adjournment of the business meeting, William C. Strong, Chairman of the Committee on Discussion, presiding. E. W. Wood read the following essay, which was illustrated by a diagram of a Ground Vinery, drawn on a scale of six inches to the foot.

Culture of the Foreign Grape in Cold Graperies.

BY E. W. WOOD.

The vine is the oldest fruit bearing plant of which we have any record. Frequent reference is made to it in Holy Writ, and its praises have been a prolific theme for writers through all time. So frequent and instructive are the allusions to vine culture in the classic poets that the college student, if he has scanned the subject, as carefully as the measure, of his Latin text, can hardly fail to possess an accurate knowledge of the peculiar soil, location, and treatment necessary for the successful culture of the grape. The vine is a plant of the greatest vitality; while it responds quickly and with great vigor to the careful and generous treatment of the intelligent cultivator, its wonderful recuperative powers are liable

to deceive the more careless and negligent grower as to the abuse it will endure, any injury not being readily perceived.

The grape is indigenous to this country, and in its wild state grows vigorously, often covering the tops of large trees and producing fruit abundantly; yet it is keenly sensitive to cold, and the wild fruit is not unfrequently destroyed by the September frosts. Except in peculiarly favored locations we are situated upon the northern limit where the grape can be successfully grown without protection, and here the earlier and hardier varieties, grown in vineyards selected with especial view to every advantage which location and soil can give, frequently prove, as last year, almost a total loss.

The frequent failures and disappointments with the grape in open culture during the past few years have led to a very general inquiry, "How can we protect and grow successfully the better varieties of grapes with the least care and expense?"

The object of this paper will be to answer this inquiry by inviting discussion to the construction of cheaper houses, and to less expensive management than is generally given to growing the foreign or exotic grape. The cultivation of grapes under glass is generally considered a work of much care and uncertainty, requiring the services of a skilful gardener; but I believe that from the amount of labor and skill often given to out-door culture, larger returns in both quantity and quality might reasonably be expected under glass. The roots of the Hamburg vine will grow in any place where those of the Concord will grow, and experience proves that, for cold house culture, the roots of one require no more protection during winter than those of the other. The tops only require protection, and as it is necessary to retain the light and to be able to increase and control the heat, houses constructed mostly of glass must be used. Grapes may be grown under glass with an aspect anywhere between east and west towards the south, but the form of house and aspect most favorable, is the common lean-to, facing south or southeast. As the heat in the house will be increased from ten to twenty degrees above that in the open air, it is desirable that the temperature of the ground in which the roots are growing should have a corresponding increase, and with a house facing due south, the border will receive the rays of the sun more directly and for a longer time, than in any other situation; while for the vines inside the house, the morning sun being more

desirable than the afternoon, a southeastern aspect would be preferable. The cost of a house will be considerably less if placed upon the south side of some building which may form the back wall of the vinery. In the front wall there should be a row of glass, in sashes from one to two feet in width, depending upon the size of the house, hung upon hinges to give circulation of air when the fruit begins to color. The roof should incline at an angle of forty-five degrees and should be of fixed glass, except a row of sashes at the top, the width to be in the proportion of one foot to every six feet of fixed glass.

Having secured the necessary protection for the top of the vine, in order to get the best results it will be necessary to prepare the border so as not only to furnish all the nutriment the roots can receive, but so that the soil and temperature shall be congenial and excite the healthy and vigorous action of the roots. The width of the border should equal the height of the front wall together with the length of the rafter inside the house, which will allow the same space to the roots that the tops are intended to occupy. The whole border need not be prepared when the vines are put out, as eight feet will be sufficient for the first two years, when more can be added as required. The whole should be thoroughly drained so that there will be no stagnant water either on the surface or in the soil. The border should be two feet deep above the drainage and should be composed of two-thirds partially decayed pasture turf and one-third stable manure, with which may be mixed, as a more lasting manure, broken bones and the hoof parings and filings from the blacksmith's shop. Unless artificial heat is to be used to force the vines the border should be entirely outside the front wall of the house, and the vines taken through directly under the sill.

With a house and border thus arranged, a full average quantity of Hamburg grapes, of superior quality, can be grown every year with almost unfailing certainty, without using water either inside or outside of the house. The use of water inside the vinery under careful direction in bright, sunny days, causing a warm, humid atmosphere, will produce more vigorous action and larger bunches of fruit; but in proportion as the size of the bunches is increased, is the fruit less evenly distributed over the vine, and, although by the use of water it may be stimulated as long as the fruit continues to grow, when it begins to take on color the water must be withheld, and the lower ventilators opened, giving a free circulation of air. The

vine, no longer sustained by an artificial atmosphere, fails to furnish sufficient saccharine matter to mature the fruit, and the result is often seen in large, imperfectly ripened bunches, while the smaller bunches upon the same vine will be well colored and of much better quality. In a house without water the labor is very much reduced and simplified, and the chance of failure very much lessened, as the imprudent use of water, or its use when not followed by sun heat, is liable to cause a sudden check to the tender growth, which is often followed by mildew, doing serious injury to both fruit and vines.

I need not stop to describe the internal arrangements of a house, as they are given in detail by all writers upon this subject, and substantially the same. The care given to the vines in a house when water is not used, is almost precisely the same as that given by amateurs in open culture, with the addition of giving air or ventilation whenever the sun shines.

From the time the vines are taken up in the spring till the fruit begins to color, air should be given by the upper windows only, which should be opened on fair mornings as soon as the temperature has risen from five to ten degrees with sun heat, and if the day continues bright they should be closed in season to retain a genial warmth before sunset. No rule as to the time for opening and closing a house can be given, as much will depend upon location. A house facing southeast will need to be opened earlier in the morning than one facing southwest, as the rays of the sun will fall more directly upon the glass, and for the same reason a house with a southwestern aspect will need to be kept open longer in the afternoon.

In starting a house, strong healthy vines, one year old, with tops at least six feet long, should be procured, and as soon as the border is in suitable condition in the spring the roots should be carefully shaken out from the soil and placed evenly on the border, one foot from the front wall, and covered with four inches of soil, and the vine passed through beneath the sill directly under the rafter. The earth should be pressed firmly upon the roots with the foot, and the tops tied up to or towards the rafter inside. If the buds all break, rub off all but the three lower ones. When they have grown to the length of two feet or more, and become strong enough to bear bending into position without danger of breaking, select the strongest and tie it to the wire under the

rafter. If the remaining shoots are below the one selected, tie them out to the side wires and cut them off twelve or fifteen inches from the cane. Cut off the old cane two inches above the base of the new growth, and two or three weeks later cut the snag away smoothly at its junction with the new growth. Tie the new cane to the wire loosely, allowing for future growth. Cut back the laterals, as they continue to grow, to the first leaf, saving two at the top in case of accident to the leader. The temperature of the house may be allowed to rise to 95° or 100°. With fair success the vines will make from twenty to twenty-five feet growth by the middle of September, when they may be cut back one-fourth their length, to ripen the lower portion of the cane. When the leaves have fallen, cut the canes back to three eyes, and before severe cold weather cover the small portion left with a piece of cloth or mat. Open the upper ventilators every day during winter when the sun shines; and during March and April, until the buds begin to break, open the house at top and bottom on bright days, keeping it as cool as possible. After the buds break keep the lower portion of the house closed. As the buds push select the strongest shoot, and when hard enough to bend without danger of breaking, tie loosely to the central wire, and if the other shoots are below the one selected tie them to the side wires and cut them off at twelve or fifteen inches from the cane. These laterals will show fruit, one bunch of which may be allowed to grow. The care the second season is the same as the first, with the addition of thinning the fruit, and as there is supposed to be but one bunch on each vine it will not be a labor requiring much time, but it will afford an opportunity for experience and observation, which, if improved, will be useful in the future. No rule can be given for thinning the bunches, as much will depend upon the varieties and the weather when the fruit is forming.

When the grapes are of the size of ordinary peas there will be more or less of them smaller than the average. Let these be removed first; then thin from the inside, preserving the full size and form of the bunch. When the bunches are large the shoulders may be tied at right angles with the bunch. It is desirable in thinning to leave just as many of the largest berries, evenly distributed, as will, when fully grown, fill the bunch out to its full size and make it sufficiently solid, without pressing, to retain its perfect form when cut and placed upon the table.

At the end of the second year the vines should be trimmed and cut back, leaving them one-third the length of the rafter. After this is done let them remain a few days, until the wounds caused in trimming become dry and hard, when they may be bent down in front of the sill, tied together and covered carefully with cloths or mats to shade them from the sun and protect them from extreme cold. Continue to keep the house well aired; open the upper ventilators whenever the sun shines during winter; and, towards spring, as the sun heat becomes stronger, give more air by opening the lower windows and the doors.

When the buds begin to push the vines should be taken up, tied to the rafter near the front wall, and the ends bent down near the floor, to check the flow of sap to the top and cause the buds to break evenly near the base. Let there be care and no haste in tying out the laterals to the side wires, as the tender growth is easily broken from the cane. When the woody fibre is formed and firmly attached they may be fastened loosely at right angles to the cane, and cut off from twelve to fifteen inches from the cane, according to the space between the rafters. If the vines are in good condition they may each be allowed to carry ten pounds of fruit. Train the leading shoot to the central wire as before. As soon as the fruit is formed remove all superfluous bunches, never leaving more than one bunch upon a single shoot. Cut in the side branches every two weeks, and when the fruit begins to color commence giving air at the lower windows, a little at first, increasing moderately as the berries make their last and most rapid growth, and when this is completed a free circulation of air may be given in bright days. At the end of the season the vines should be cut back, leaving them two-thirds the length of the rafters, and treating them as before during winter. The fourth year, if the vines are in good condition, they may be allowed to bear fifteen pounds of fruit each, and at the end of the season may be cut off at the full length.

To prove that a full average quantity of fruit, of more than average quality can be grown in the manner which I have briefly and imperfectly described, I will refer to a vinery upon the place owned and occupied by Mrs. Charles B. Shaw, in Dedham. This house, which is of unusual height, the rafters being twenty-four feet in length, was built, and the vines were planted in 1851. It contains eighteen vines, mostly Black Hamburg, Victoria Ham-

burg, and Wilmot's No. 16. The amount of fruit in this house from 1855 to 1875, has averaged between five and six hundred pounds, never in any year having fallen below the smaller amount, and in some years having exceeded the larger quantity. Fruit from this house was once shown at one of our exhibitions and received the Society's Silver Medal. This house was built by, and for twenty-four years has been under the care of Robert Watt, of West Roxbury, who has taken the vines up every season, tied out the side branches and kept them properly trimmed, thinned the fruit, trimmed the vines in the fall, and covered them for winter, at an average expense of less than twenty-five dollars per year. The only additional labor connected with the house has been to open and shut the windows, which has been done by the help employed upon the place. No water has ever been used in this house. No protection has been given to the border except to spread upon it a top dressing of manure after the ground had frozen in winter. I might refer to other houses in this immediate vicinity, conducted upon the same plan, with equal success, but the one at Dedham is the oldest of which I have any knowledge. For the benefit and encouragement of the ladies who may wish to engage in grape culture under glass, I am permitted to copy a few lines from a letter recently received from a lady in Portsmouth, N. H., who, having heard of Mr. Watt's simple plan of growing grapes, employed him, in 1867, to construct a house, prepare the border, and plant the vines. He recently wrote her, making some inquiries as to her success, and from her reply, I quote the following:

"In answer to your inquiries about my grapery, I am happy to tell you that the vines were planted eight years ago last spring, and I think I have had great success in growing grapes. They have been fairer and larger than any raised in town, gentlemen who have graperies being astonished at the size and flavor of mine. I lost no vines last winter; I have never used water in my grapery; I have never had any mildew."

I have endeavored to show that the care of a vinery may be made very simple, and that the labor can be properly done by any help competent to grow successfully the various fruits in the garden, and it may be claimed that if properly treated, no fruit can be more confidently relied upon for an annual crop. Yet no experienced grower ever uncovers his vines in the spring without a nervous fear that he may find a part or all of them winter killed,

and this fear is increased by the fact that the cause of the destruction is not well understood, some attributing it to extreme cold; others to the wood of the previous year not having been thoroughly ripened, and still others claiming that it is because the borders are not sufficiently protected. A sufficient answer to the last mentioned reason would seem to be the fact that the tops only are injured, the roots sending forth a new cane of strong and vigorous growth from below the sill. That it cannot be caused by extreme cold would seem to be shown by the fact that a greater loss does not occur in winters of extreme cold. A few years since, the thermometer in some places in this vicinity, dropped to twenty-six degrees below zero, yet there were very few if any vines killed that winter, while in the winter of 1874–5, without an extreme degree of cold, probably more vines were killed than ever before in any one year in this vicinity. Without presuming upon a knowledge which my limited experience would not warrant, I may give the results of my observations the past winter in my own neighborhood.

In the spring of 1871, three vineries were started, all near together. The vines were all planted by, and have been under the care of the same man during summer; they have had a uniform growth and appearance up to the time they were trimmed and laid down in the fall of 1874. In one of the houses the ventilators were occasionally opened during winter, and irregularly opened through March. In another the upper ventilators were opened every day while the sun was shining. In the third house the upper windows were opened every bright day in the earlier part of the winter, and after the middle of February, when the days were bright and warm, the lower windows and the door were opened. Upon taking up the vines in the spring every vine in the first house, eighteen in all, was killed down to the sill. Out of twenty in the second house, seven were killed, while not one of eighteen vines was injured in the third house.

This would indicate as the cause, the sudden changes of temperature, and especially would these be dangerous in the latter part of the season, when we have, as last year, an unusual number of bright, sunny days followed by cold freezing nights, and it would suggest as a remedy the careful covering of the vines, rendering them less liable to be affected by either heat or cold, and keeping the temperature of the house cool, and as even as possible.

To those who have limited grounds and cannot afford the room necessary for a house and border, or to others who cannot afford the expense necessary in the construction of a house, but who still desire to cultivate foreign grapes, the ground vineries afford an opportunity at an expense scarcely greater than that given to more hardy kinds in ordinary garden culture. These vineries, in substantially their present form, were introduced in England in 1860, by Thomas Rivers. They are miniature span-roof houses, those first used by Mr. Rivers being seven feet long, thirty inches wide, slope of roof twenty inches, and depth from centre of roof sixteen inches. These were placed upon a row of bricks upon each side for a foundation, and ventilation was given by leaving open spaces between the bricks; also by small openings in the ends near the ridge of the roof. The roots of the vine were planted at the end of the house and the top taken in between the bricks. Mr. Rivers soon found, as the vines gained in size and strength, that by leaving out the ends and connecting one house with another he could extend his vines indefinitely. After five years' experience he writes as follows, under date of September 8th, 1865: "A fine vine here of the Trentham Black Grape, occupies five seven feet lengths, and is of course thirty-five feet long. This is bearing fifty nice sized bunches of grapes, now fully ripe. Another vine, the Black Hamburg, is also bearing a fine crop of sixty-three medium sized bunches, the grapes full sized, finely colored, and fast approaching to ripeness. There seems to be a most agreeable and animating prospect of these neat looking and most useful structures occupying thousands of small gardens, and giving the luxury of fine, ripe grapes to many who are capable of appreciating and enjoying them."

These vineries have come into very general use in England, and I believe are even better adapted to use here than they are there, as the larger proportion of bright sunny days with us would be especially favorable for ripening the fruit in this class of houses. A neighbor of mine had some houses of this kind built in 1871. They were of the following dimensions: six feet long, four feet wide, slope of roof three feet, and depth in centre two feet four inches. The order for these houses was given to a carpenter who had had no experience in this work, and they were furnished at a cost of six dollars and seventy-five cents each. If any considerable number were wanted now they could probably be supplied for

five dollars each, and perhaps for less. These houses were put to different uses. In some were early vegetables, in others bedding plants, and in one were put two Black Hamburg vines. The house was placed in the vegetable garden, with one end towards the south, and the soil underneath and at the south end enriched with stable manure. The roots of the vines were placed in the soil outside the house, and the vines taken in and trained one upon each side of the house. They grew rapidly, but the house being so situated that it was inconvenient to join another to it, it became necessary to cut the vines off in the fall at the length of six feet. Before the ground froze the house was removed to the stable, and the vines covered with eight or ten inches of soil. They were found in good condition in the spring and were allowed to produce five pounds of fruit the second year; the third year fifteen pounds and ten ounces; and the fourth year fourteen pounds and two ounces. The same gentleman started several houses the past year with the intention of joining two together, allowing the vines to grow to the length of twelve feet instead of six, being fully convinced that this plan offers the quickest, safest, and most economical way of growing Hamburg grapes.

If a more general use of these houses fulfils the expectations which a limited experience seems to warrant, it will go far towards answering the question, "How can we grow successfully, with the least care and expense, the foreign grape?" It is a subject which interests every family, as there are few things that add more to the attractions or enjoyment of our homes than a liberal supply of the various fruits in their season.

Discussion.

Marshall P. Wilder said he was at Mr. Rivers' grounds in 1867 and had ocular demonstration of the usefulness of the ground vineries. The world owes a great debt of gratitude to him for this invention. Mr. Rivers, who is now more than eighty years old, has done more than any other man in England, for fruit culture.

The Chairman asked what objection there was to leaving cold graperies open all winter. His experience was that it might be safely done except in snow storms.

Henry F. French asked why it would not be beneficial to cover the vines with mats more closely than is usually done.

Mr. Wood replied to the Chairman that if it was certain the house would be closed in a storm it might be safe to leave it open at all other times, but one could only be sure this would be done by attending to it himself. If help were directed to close the house whenever the weather was cloudy they would do it, but if left to their discretion, it would be very likely to go wrong.

E. S. Rand, Jr., said that he had listened with great interest to Mr. Wood's paper, on a subject concerning which there had been a great deal of ignorance. He believed the cause of winter killing to be cold, dead air; it is almost impossible to heat it. The sextons of churches find it impossible to warm them, after they have been closed nearly a week, without opening the windows freely. There seems to be some peculiar property in confined air that causes winter killing in houses. He had given directions to have his grapery opened every sunny day, but not to let the air play through when severely cold.

P. Brown Hovey said his experience had been that there is no certainty in keeping grape vines over winter but by covering with soil. He would not have front ventilators. He had a house with front lights two or three feet high, which were opened in summer, and always had mildew there in spite of using the solution of lime and sulphur which was recommended as an infallible preventive. As the house grew old it settled, so that the front lights could not be opened, and after that he had no mildew, and found that it was caused by currents of air. He thought it best to keep the house dry and not to be always syringing, but would give plenty of air at the top.

Mr. Wood said that he did not open his front ventilators until the fruit had begun to color.

Mr. Wilder said that there was no danger of mildew after the leaf and wood had attained nearly to maturity.

Robert Watt said that he had been growing grape vines in this country since 1844, and though he lost some by bleeding, he had had none killed by cold until 1868. He had adopted the plan of leaving the borders uncovered until after they were frozen. He thought the winter killing was caused by the houses not being ventilated. Thomas Barrows' house was not opened from December to the end of March, and every vine was killed down to the sills. Thomas Liversedge had one house all killed and half of another one; neither of these houses was opened. Judge Reed's was

badly killed; Col. Lyman's and Mr. Stone's were all killed. Charles B. Shaw's, Ira Cleveland's, John Emmons' and Jeremiah Pritchard's houses (the last a span roof of one hundred feet in length), were properly aired and not a vine was killed. In 1875 nearly the same, and in some cases worse, results followed; H. A. Gane's, Mr. Barrows' and Mr. Stone's were all killed; Mr. Pritchard's were badly killed; Mr. Liversedge had one house killed and another not. It has been said by some that this winter killing was caused by badly-drained borders, but Mr. Liversedge's border was made by David Haggerston, and the vines were planted by him and Messrs. Quant and McLennan, and everything was done in the most thorough manner. No vines were killed there until 1868; and last year, when he was sick and unable to attend to the ventilation of the houses, more were killed. There was no indication of injury to the roots.

Mr. Watt said that he had made twenty-eight borders, and to show the manner in which they were drained, instanced Mr. Barrows', which was on a sidehill. Stones were placed under the border to the depth of from two and a half to three feet, to bring it to a level; then a covering of fresh turf with the green side down; then three feet of the top spit of a pasture, thoroughly mixed with one-fourth part of manure. The border was made in the fall, and in the spring the whole was turned and the vines planted.

Mr. Watt added that the later vines could be kept back in the spring the better. The earliest date at which he had commenced thinning was the 19th of June, and the latest the 14th of July. He had used no water in vineries for twenty-five years, though before he came to this country he never thought he could raise grapes without water. He used very little sulphur, and gave very little air. Mr. Rand's house had the least water of any house he ever saw, yet there was an entire absence of sunburnt leaves, which he had never known before. He agreed with Mr. Wood that the help must air the house, as the owners could not always be at home to attend to it. Mr. Watt spoke of a house in New York which was used as a greenhouse in winter and a vinery in summer, and answered admirably.

The Chairman said that he formerly had three vineries, each two hundred feet in length, which he threw wide open in fall, and left them so except in severe storms, the vines being covered with mats.

Charles M. Hovey expressed his dissent from Mr. Rand's views of the cause of winter killing, and said he would not like to have it go out from this Society that vines were killed by dead air. He asked whether the houses mentioned by Mr. Watt were treated the same in 1867 as in 1868, and if they were, why the vines were not killed in 1867 as well as in 1868.

Mr. Watt replied that the houses received the same treatment in both years.

C. M. Hovey said the vines were not killed by cold but by heat. Long continued sunny weather, when the house was closed, started the vines, liquifying the starch and sugar stored up in the wood; then very cold weather set in again, and two or three such changes killed the vines. It is well known that pelargoniums and many other tender plants will stand a single frost without much injury, but repeated two or three times it will certainly destroy them. Mr. Luke, a neighbor of his, who has a small grapery, always lowers two or three of the sashes of his vinery after pruning and laying down in autumn, and leaves them open all winter, keeping the house at a cool and even temperature, and he always has good grapes, as many can testify who have seen them exhibited on our tables. We have made no improvement, so far as good culture goes, in ventilation, over the old sliding sashes used in Speechly's time.

Eliphalet Stone said that the point we wish to ascertain is the cause of the loss of so many vines. Many of the houses mentioned by Mr. Watt were known to him. Mr. Hovey was right when he said that it was not heat or cold that injured vines, but the changes, and Mr. Strong was right in leaving his houses open. A cold grapery needs ventilation in winter as well as in summer. We trim our vines in autumn and lay them down to protect them from heat. Herbaceous plants out doors are destroyed by the heat of the sun in winter. Glass gives a tremendous heat in winter; four weeks ago a closed grapery would have been up to 125°. These vines are almost human, with every bud having a distinct individuality, and the heat of the sun sets the buds and the fertilizers at work. The tree is made up of cells filled with water and air; heating expands the cells and the vines are split. The reaction from heat to cold is the cause of the whole trouble. If you will ventilate your house in winter your vines will be safe.

Benjamin G. Smith said he had a duplicate of Mr. Luke's

vinery, and Mr. Luke had been his instructor in its management. From the 20th of June to the first or middle of August, he keeps the ventilators open day and night, excepting in heavy easterly storms. In winter he airs the house thoroughly, always keeping the ventilators down in the day time, except during severe storms. His house has no ventilators at the base. He covers the vines with mats.

C. M. Hovey said that Mr. Luke had never had a hired man to look after his house, though he is away at his business during the day, yet he raises good grapes. His house is no trouble whatever, for six months in winter. He agreed with P. B. Hovey, in regard to ventilation. He had been asked hundreds of times how to prevent mildew, and he answered that the house must not have a draft through it. The vines do not want to be in a draft any more than a man does. It is a very simple thing to raise good grapes, but it requires great care and skill to produce superior fruit, or such clusters as have been lately shown at Edinburgh and London, the Black Hamburg weighing twenty-one pounds, and being well colored, and the bunches of ten different varieties exhibited averaging seven pounds each. The Raisin de Calabre weighed twenty-six pounds and four ounces, and the vine produced another bunch of eighteen pounds, and two more of six pounds each. The White Nice weighed twenty-five pounds and fifteen ounces. These were forced grapes. The largest bunch ever raised in this country, so far as he could remember, weighed about seven pounds. Some of the best grapes he had ever seen raised in this country, were produced by Mr. Haggerston, when gardener at Mr. Cushing's, Belmont, and by J. W. Russell, gardener to the late Mr. Lemist, of Roxbury. He had seen these houses full of Muscat of Alexandria, Hamburg, and Syrian grapes, averaging two and a half pounds to the bunch.

The Chairman differed from Mr. Hovey, and did not regard these great bunches as results of the highest culture. He wished to hear from Mr. Watt concerning the quality of such grapes.

Mr. Watt replied that he would prefer bunches of from a pound to a pound and a half in weight to those of two pounds. He had never been able to color large bunches as well as small ones. The weather when grapes blossom makes a great difference. He would like dull weather for Hamburgs and fine for Muscats. He seldom saw a bunch with four seeds to a berry, and you cannot

get a large bunch without good seeds. He questioned whether the exhibitors at our shows could duplicate their bunches.

C. M. Hovey alluded to the bunch of grapes brought by the spies from the Promised Land, requiring two men to carry it. He did not believe they had a very dry climate where these were found. Grapes require water, but it must be given with judgment, and at the right time. When he read the account of the grapes of Eshcol he thought there might have been cultivators at that period who were in advance of some of those of our day.

Mr. Watt said that he had been at the horticultural exhibitions at Edinburgh, Glasgow, etc., and had seen as poor bunches shown there, even by Charles M'Intosh, as he ever had in this country. He had seen little stones hung to the ends of bunches to draw out their length. He had seen better grapes grown here than in the old country. And yet here we dig out a hole and fill with fertilizers for a grape border, while in the old country the graperies are built in the middle of the garden, where the roots can ramify at pleasure. The famous Hampton Court vine is believed to have sent its roots into the common sewer, and he had himself seen an instance when the roots of a vine had left the border and travelled through six feet of garden walk and seven feet of cobble stones, to feed on the decomposed manure of a hot-bed. If we made our borders wider and not so deep we should be more successful.

E. H. Luke said that he left his house open at the top, from the middle of June until the grapes were pretty nearly ripe, except in foggy weather. He had three lights down now, and they had been so all winter.

The Chairman remarked that Mr. Luke's and Mr. Smith's method of throwing the house open was almost as simple as out-door culture.

Hervey Davis said that he cultivated a grapery from 1862 to 1872, and never opened it in winter, and never lost a vine. They were laid down and covered with straw.

Mr. Wood said, in regard to ground vineries, that the vines in them required no more care than if trained on stakes in the open air. The vines are supported on crotched sticks, and the vineries are ventilated by a small triangular opening at the top of each end as well as by openings at the sides. Mr. Frost has had them in use for four years and has never had any mildew.

The Chairman said that the question is whether the ground

vinery or the common lean-to is the most economical. He thought a cheap lean-to would be, but Mr. Wood thought the ground vinery cheapest.

James Cruickshanks remarked that a good deal had been said about giving air in vineries in winter, and he regarded the practice as correct. He had always seen peach houses as well as grape houses left open after the fruit was gathered, and had shovelled out snow before preparing for forcing.

John B. Moore said that Mr. Frost began by making his ground vinery out of two hot-bed sashes, each six feet by three, such as are within reach of every one. They were fastened together at the ridge by hooks, and when the grapes had ripened could be piled away like any sashes, occupying very little room. Mr. Hovey had alluded to the improved methods of ventilation as being no better than the old, but Mr. Watt would tell us to use the modern style. To give it up and go back to the sliding ventilators would be like giving up the horse rake and going back to the hand rake. We must consider the great saving of labor.

MEETING FOR DISCUSSION.

SATURDAY, February 12, 1876.

William C. Strong, Chairman of the Committee on Publication and Discussion, presiding.

The Chairman remarked that in some respects it was unfortunate that our exhibitions had increased to such an extent that we lost their inspiring presence here, and yet he could not but congratulate the Society that the shows had grown beyond the limits of the Library Room. The display on this occasion was undoubtedly the finest ever made by the Society at this season of the year. Among plants particularly worthy of mention were the fine specimen azaleas shown by J. F. Rogers, Mr. Rand's display of orchids, C. B. Gardiner's prize cyclamens, and James O'Brien's beautiful table design.

The Chairman then called on Dr. G. F. Waters to read the following paper which he had prepared for this meeting, a portion of which, relating to his experiments in the improvement of corn

and the production of seedling peaches, is here presented in a condensed form.

Acclimating Plants.

BY G. F. WATERS.

It is well known that plants—I particularly refer to fruits, grains, and vegetables—have spread over the earth, and become able to endure great ranges of temperature, from circumscribed local beginnings. How that has been brought about is, with many, a mooted point. It was early observed that habits of growth corresponded with local conditions, and that those habits appeared to be fixed in each peculiar case. Improvement seemed for a long time to be the result of accident, or of culture applied for some other purpose. Very gradually, the food plants of the semi-tropical regions became inured to the temperate climates, changing their habits with changing conditions, until to-day the food plants of southern Europe are perfected in our less genial climate. When it was observed that nature gave to the seed of a plant which had been removed to a climate more or less favorable for its development, the power of imitating one whose period of growth would be somewhat conformed to the changed conditions, and that successive plantings secured perfect acclimation, a new impetus was given to acclimation, and change of aspect was soon found to be almost, if not quite, the equivalent of change of climate. When the causes operating to produce such results were considered, they were ascribed to the accidental sporting of seeds under improved culture,—to the tendency of vegetable life to be more excitable, and to come earlier into activity in a cold climate,—to a natural tendency of plants to adapt their habits or qualities to every climate in which art or accident might place them,—to the modifying power of climate over transmitted qualities or hereditary tendency,—to the tendency of a prolonged season to give more complete maturation; and, as the process of maturation must be reversed before germination can begin, it follows that those seeds which are gathered before they are quite ripe, will, when planted under favorable circumstances, germinate quicker than more thoroughly ripened seeds. It was also noticed that seeds planted as soon as ripe, germinate quicker than if allowed to dry before planting.

Whilst residing in Waterville, Me., I developed a variety of sweet corn, which acquired a very early habit. I commenced my experiments in the spring of 1855, on a lot which had been for two generations a garden, but for a few years previous had been abandoned to weeds. The soil was black and unctuous, consisting of decomposed slate, mixed with road wash. A dyke of hard slate, with a vertical dip, crossed diagonally from northeast to southwest, two feet below the surface, serving to warm and enrich the soil. The surface sloped gently to the southeast from the crown of the ledge, and was level north of it. A row of maples on the north side, and some large apple trees on the south, gave shelter. The ground was ploughed about the first of June, and a variety of sweet corn from the Patent Office, with large, shrivelled kernels, was planted just over the ledge. It received no dressing, nor any care beyond keeping down the weeds, and grew slowly until the last of June, when it took a start and grew with great luxuriance, bearing two or three ears to a stalk, and remaining green until the middle of October, at which time the kernels were very small and immature, but very sweet. The germinal part, the chit or embryo, was better developed than the food sac or endosperm, the kernels small, and the cob enormous. Being struck by hard frost, it was cut up and housed the third week in October. There were many stalks from nine to twelve feet high. The ears reserved for seed were hung away, and the remainder seemed to fill out after it was housed, so that the last cooking was better than the first.

The second year it was planted in well prepared soil, about the middle of May, a succession being sown until the first of June. After coming up a dressing of unleached hard wood ashes was given, and later an occasional application of liquid manure made from hen dung, between the rows. It was cut up the middle of September, four or five weeks earlier than the previous year, and found to be better filled out, and as it was planted only three weeks earlier, it had shortened its period of growth more than three weeks. Some which had been transplanted was much in advance of the rest and gave the first corn for the table. The ears marked for seed, by some mischance got into the pot, and the loss was not observed until killing frosts came, when the most promising of the second planting were selected. The kernels of this planting were not so well filled as the year before, and it oftener had twelve or fourteen rows than sixteen.

The next spring, 1857, some of the corn was sown in pots, to test its vitality, and about the third week in May transplanted to the warm soil over the ledge. A severe northeast storm checked it, but it recovered and spindled before the middle of June. The pollen was shaken over the silk many times daily. The cobs were short, ten rowed, and only fruited midway between the ends, giving a hint to take seed in future from the middle of the ear; indeed this course had been pursued in this year's planting. By the middle of July, it was fit for the table. The second planting ripened fully, and was used for seed the next year, because it had a shorter period from seed to harvest.

The next year the first planting was made the second week in May and was fit for the table the first week in August. The ears that first showed silk, where two grew on a stalk, were marked for seed. Few ears had more than ten rows, and many but eight.

The practice after this was to sow according to the Indian rule, when the leaves of the white oak were as large as a squirrel's ear, dressing the ground with hard wood ashes before planting, and during the growing season with the liquid hen manure. Soon after 1860 I left Waterville, and discontinued my experiments, which had resulted in producing an earlier variety than the early yellow Canada. This earliness was gained partly at the expense of size and quantity. In five years it shrank from sixteen to eight rows, while its period of growth was shortened from four and a half months to less than two and a quarter, and it has frequently been gathered for the table in sixty days from planting.

In 1866 I tried an experiment at Newton, Mass., in producing seedling peaches, from a small, hard, green, late, bitter variety, using chance fallen fruit that had been exposed to the frosts all winter; seven out of nine in the first generation bore fruit of fine quality, ripening early in August. Some peaches from one of these seedlings were presented at the exhibition of the Society on the 13th of August, 1870, and received the commendation of the Fruit Committee. The stones of these peaches were all small and without germinal parts.

It is understood that, in the germination of grain or seed, the food stored in the endosperm or cotyledons, for the young embryo to start with, must, if fully matured, undergo a change, the reverse of ripening, whereby it is rendered again soluble, and capable of being transported by the sap to the growing parts of the

young plant. It is also generally understood that heat and ferments produce this change. I think it may also be shown that frost assists, if it does not, in some cases, cause the change. It is not uncommon, in cold countries for the early snows to remain all winter, thereby preserving the ground from deep freezing, and from the effects of frequent thaws. Such a condition obtained with me one winter, while living in Waterville, Me., and a potato of the Peach Blow variety, that had been overlooked in the fall harvest, wintered in the ground and began to grow in the spring, breaking ground a week or more before it was thought proper to put in seeds. This plant grew more stocky and thrifty, than any potato I ever raised, of that variety, yielding many large tubers, much earlier than usual. It suggested an experiment, tried by me the next fall, with the Chenango. Preparing a trench, ten inches wide, by eight in depth, I put in the potatoes, covering five or six inches with earth, filling up the trench with corn stalks, and also making quite a pile of them above the surface of the ground. Late and light snows, frequent thaws and hard freezing, the mercury going far below zero many times that winter, wrought mischief with my experiment. As soon as the danger of hard frost had passed, I opened one end of the trench, to see how the potatoes had wintered. They were all soft and rotten. It being too cold to plant, the ground was left to dry and warm up. A few days after, I observed near this place, a hen pecking at something white as marble. I deprived her of her treasure, and taking some from the point of my knife, found it sweet like grape sugar, dissolving readily in the saliva, and seeming to leave behind no insoluble residüum. It was one of my fall planted Chenangoes, and its contents, starch, gum, cellulose, and water, had turned in the depth of winter, apparently, to glucose. But how? My mind went to work on the problem. It could not have been caused by heat, and, without that, ferment seemed out of the question. What other agent had been at work there? Frost, undoubtedly, had been there many times during the winter, but frost had no reputation for such work. It then occurred to me that potatoes cooked after freezing are sweet—sweeter than old, sprouted potatoes. After a second freezing, though said to be spoiled, they are sweeter and more glutinous. By a long application of heat, with acid or ferment, there is no difficulty in turning the entire potato to glucose, except perhaps, a portion of the water and the sulphur, phosphorus,

potash, and lime; the first two pass off mostly as odorous gases. How is it possible for frost to do this? Boiling with sulphuric acid at 213° ruptures the starch cells, sunders their contents, which changes to dextrine, and then to sugar. The same results are obtained by fermentation. We know that frost sunders the starch cells. The wilted condition of the once frozen potato evinces this, before we examine its contents. Who ever saw a mealy potato, when it had been frozen before boiling? It presents somewhat the appearance of one that has begun to sprout, but is sweeter and less firm, showing the effect produced upon the starch. Have we any other example of such work by frost? I recalled to mind that some seeds are said to germinate better, after exposure to frost, and that some will not germinate without such exposure. It is said that the office of frost, in these cases, is to rupture or soften the dry, hard pericarp, whose obduracy resists the warm rains and moist earth, sometimes for more than a year. But let the frost once exert its influence, and then, under a proper degree of warmth and moisture, the seeds show a celerity of movement only excelled by the progenitors of that troublesome insect the canker worm, under like influence. I had tapped my maples for sap, and the sugar came to mind, heretofore ascribed to the change in cellulose, starch, and gum by dextrine, heat, and ferment. But the sugar from the maple differs from the sugar of the potato, by the equivalent of one half molecule of water, and the potato has sixty-five per cent. of water to thirty-three or less, in the maple. Would that account for the difference in the sugars? "The first run of sap is sweetest." "The nearer the bark, the sweeter the sap." "The farther from the ground, the sweeter the sap." "Successive freezings give continuous supplies of sweet sap." All these aphorisms of the sugar camp went through my mind. But they proved nothing. They were only suggestive, and the conclusion was that frost at least assists, even though dextrine and ferment get the credit. A hard frost in the fall, by checking the process of maturation, if it does not turn back the starch and cellulose to dextrine and sugar, at least affects them in such a way that less work has to be done in the preparation for germination in the spring, so that the young plant comes earlier into activity, and with a richer or denser sap. A statement in one of the magazines, that frost killed some plants sooner than others, because of the difference in their density, due to the difference in the size of their

cells, set a young friend of mine, up in the hills of New Hampshire to thinking that, possibly, density of sap or cell contents would do as well, and he tried this experiment. In the fall, when the prospect was rain, with a strong probability that it would be followed by hard frost, he scattered over the ground, about some hills of potatoes, some soluble salts. In a few days came a rain, and that was followed in a couple of days by a frost that killed down all the potatoes, except those in the hills about which he had scattered the salt. His father observed the fresh foliage of these hills among the dead vines, and said he guessed they had mixed the seed in planting. My young friend writes, "I did not tell what I had done, fearing that the ultimate results of the application might be worse than the frost, and as we had a hard frost the next night, which they did not stand, I lost my experiment." Was he not right in his speculation? Frost injures plants by rupturing the cells, in the crystallizing of the contained water. Salt water, milk, and cider, do not freeze as soon as clear, fresh water; therefore, is it not reasonable to suppose that the young plant whose germination began under such favorable auspices, will be better able to resist the late spring frosts, and therefore to start earlier, and will give to its progeny a like habit? It is of the first importance that the young plant should be able to begin its work early in the spring, while light and heat are on the increase, as plants appear to grow under an increase, and to mature under a decrease, of light and heat. This influence, of increasing light and heat, is what gives to the morning sun its reputed value over the evening as a stimulant to plant growth. And that which is true of the day, in respect to the sun's influence, is true of the year. Hunt found by the use of glass of different colors, that cell growth was stimulated under yellow light, as we see illustrated in cloudy weather in the spring or summer; functional activity under red and blue, and maturation under violet. Gen. Pleasonton's experiments confirm Hunt's, particularly as to the value of the blue and violet rays in development and maturation. The violet are the most refrangible of the sun's rays, and the red the least. Owing to this difference of refrangibility, the violet and the blue rays strike the leaf more nearly vertically in the morning and evening, than the red rays, and hence the plant is more under their influence at those seasons, and this is the case in the fall, winter, and spring, for the entire day, while the sun is in low declination.

Doubtless, artificial heat, skilfully applied, as it is in the raising of plants under glass, may take the place of the less refrangible heat rays, to some extent, but not enough to prevent the plants from showing their appreciation of the increasing influence of the sun, as he starts on his northward journey about the last of December. The rigor of all northern climates prevent unprotected plants from showing their appreciation of this gradually increasing influence of the sun, till the amount of it has become sufficient to prevent hard freezing at night, and just in proportion as they have been prevented from yielding to that influence is their activity great; so by late planting, greater activity in early life is obtained, and the maturing effect of the gradual withdrawing of the sun's heat influence, and the increasing power of the violet rays bring the plant sooner to maturity, thus shortening its period of growth, and rendering its seed capable of coming earlier into activity, in the spring. If, to the sun's influence, there should be superadded that of the fall frost, checking maturation, and holding the food elements of the embryo where they are best fitted to be taken up in the spring, then we have seeds which will germinate still earlier, and thus will be longer under the accelerating influence of the increasing heat and light rays of the sun, and so, *will show better development than their progenitors, and as short a period.*

Discussion.

Marshall P. Wilder asked whether Dr. Waters' improved varieties were produced wholly by planting, or whether the scientific principles referred to were taken into consideration.

Dr. Waters did not think that acclimation could be accomplished with a single plant, but believed that it could be with a series, by repeated sowings of seed.

Charles M. Hovey said that he had been much interested in Dr. Waters' recapitulation of facts, but did not see their application to the acclimation of plants. There is much to be said on that point, but the improvement of plants is quite another thing. A society for the acclimation of animals and plants existed in Paris for many years, but still acclimation is a thing which has never been accomplished. The English climate is not warm enough to ripen Indian corn, tomatoes, squashes, melons, or cucumbers in the open air, under ordinary conditions. Mrs. Marryatt's gardener informed Mr. Hovey many years ago that he attempted the culti-

vation of Indian corn, near London, but without success. The *Rhododendron arboreum* was introduced into England from Nepal more than fifty years ago, and has been confined to greenhouse culture ever since, repeated sowings having had no effect in acclimating it. But after a time it was hybridized with the hardy American species introduced some years before, so that the progeny were half *arboreum* and half *Catawbiense*, and these seedlings were crossed again with the hardy species, making them one-fourth *arboreum* and three-fourths *Catawbiense*. By this process the deep, rich, superb colored flowers of the Indian species were finally combined with the hardy constitution of our American shrub; but the hybrids were tender exactly in proportion to the amount of Indian blood they retained. Canary birds have been bred here for many generations without the slightest effect in acclimation. Our summers, as well as those of Canada are as much tropical as those of New Orleans, enabling us to produce many tropical plants at that season in perfection; but this is not acclimation. Gladiolus bulbs may survive the winter when left deep in the ground, and covered so thickly with snow that the frost does not reach them; but they do not become acclimated, or at least they have not so far. Mr. Hovey agreed with Dr. Waters that frost has, to a great extent, the same effect on plants as heat. Seeds which require much heat to germinate will endure a temperature of—20°. He had had amaryllis seeds so exposed which came up better than those that had not been subjected to frost. Acclimation has been pretty thoroughly examined and discussed by scientific men, who have considered it a failure.

Mr. Wilder said that the reason why seeds plucked early germinate more freely, is that the pericarp is not so hard. He had been trying for forty-five years to believe in acclimation, and after spending much time and money in importing plants and endeavoring to adapt them to our climate, he had come to the full conclusion that the acclimation of plants in places not naturally suited to them is a chimera of the imagination. The human constitution will frequently endure the change of country and climate, but the extent to which plants can bear these changes is fixed by immutable laws, and all attempts to acclimate such as are not naturally congenial, will fail in the end, except within very narrow limits. Not, however, that a tree or plant may not sometimes endure greater degrees of cold or heat than it is subject to in its native

climate, but this is merely an accidental test of its endurance, and entirely distinct from what is commonly understood by acclimation. No one should suppose that time will produce a physiological or constitutional change in a plant. All the acclimation we can ever arrive at we must produce by the sowing of seeds, hybridized by the hand of man, or naturally cross-fertilized by insects or the air. Seeds produce a new being, and it comes down to this, that if we wish to acclimate we must do it by producing this new being. Some of our most tender fruits are from cold regions; the Black Tartarian, one of the tenderest cherries, for instance, came from the Crimea, while plants from warmer climates sometimes prove hardy here. He had tried experiments in acclimating plants at the expense of thousands of dollars, but without success.

Dr. Waters said it was hardly to be expected that the character of plants could be changed more easily than that of animals. They both begin life with certain tendencies, the development of which may be retarded or accelerated. In the first volume of the "Transactions of the London Horticultural Society," is an account by Sir Joseph Banks, of a successful attempt to acclimate the *Zizania aquatica* in England. The seed was procured from Canada, in 1791, and sown in a pond where it produced strong plants, which ripened their seeds. These seeds vegetated the next spring, but the plants produced were weak, slender, not half so tall as those of the first generation, and grew only in the shallowest water. The seeds of these plants produced others the next year sensibly stronger than their parents of the second year. In this manner they proceeded, springing up every year from the seeds of the preceding; every year becoming visibly stronger and larger, and rising from deeper parts of the pond, until 1804, when several of the plants were six feet in height, and the whole pond was covered thickly with them. In most cases where valuable results have been secured in the way of acclimation, they have been accidental. In England they do not attempt to produce Indian corn from their own seed. There they have a large amount of yellow rays, and the result is a great deal of coarse cell growth. If we attempt too much in the way of improvement there will not be time to develop seed from plants whose qualities were given in a climate with a long even season; the season with us is not long enough, and consequently, while the germ and cotyledons mature,

the fleshy envelop does not. If the germ is perfected you may, from that, obtain a plant which will require a shorter season for the perfection of its fruits.

Rev. A. B. Muzzey thought the Darwinian theory, though not to his mind fully established, gave encouragement to attempt the improvement of plants, and hoped that the remarks of the experienced horticulturists who had preceded him would not have the effect to deter our younger friends from experimenting in the direction indicated by the essayist. He thought there was much encouragement to do so, in the power possessed by the human race of adapting itself to all climates, and asked if this principle could not be carried over into the vegetable world, between which and the animal so many links have been discovered. He hoped that our friends would go on and experiment, and felt sure that, whether they succeeded or failed in acclimating plants, their experiments would shed valuable light on horticulture. Although it was contended by some that the climate was less favorable now than formerly for horticulture, he believed that it was essentially unchanged.

Mr. Hovey said he would not discourage young men from experimenting, but he had spent so many years in vain attempts at acclimation, that he would not like to have others lose valuable time in repeating them. It was well known that our cultivated strawberries include five distinct species, among which are the *Fragaria grandiflora* and Chili strawberry (*F. Chilensis*), natives of Surinam and South America. Before the introduction of these two species no very large strawberries were known, and it is their blood, infused into the native kinds by fertilization, that has given size to the large English strawberries, so well known, such as Myatt's British Queen, which has been grown to weigh two ounces. But this blood has given tender plants as well as large fruit, and though the British Queen, and others of the same class, no further removed by crossing, are still raised in England, they have all died out in our northern climate. Mr. Hovey received from a friend in Chili seeds of strawberries which he said were nearly two inches in diameter, but the plants raised from them gradually disappeared from the effects of our cold winters, until they were all dead. By repeated hybridizing this tenderness has been worked out and the size retained; but the acclimation of the species, or even of one or two removes by fertilization, has been a decided failure.

Mr. Hovey added that he imported many years ago, several dark red rhododendrons for the purpose of hybridizing and securing seed, but though they grew well enough in summer they died down every winter. He protected some of them until large enough to furnish seeds, but the plants raised from them all disappeared after one of our very severe winters. He believed in selection and improvement, and said that we must follow up improvement with regard to earliness, hardiness, and foliage. The province of the Society is to encourage improvement in the right directions, and not to follow the fallacy of acclimation. We should keep quite distinct the principles of *improvement* and *acclimation*.

The Chairman said that he had no facts to add to what had been stated, but he was very glad to listen to the particulars of the method by which Dr. Waters improved his corn. He did not agree with the sweeping assertion that there is no such thing as acclimation, and thought the orange tree and the Canary bird did not prove it. It is beyond reason to expect that such tropical products will ever adapt themselves to our climate. The question is whether there has been the slightest improvement, and he saw no reason why we might not witness some slight modification, as in the human race. Some things that verge upon hardiness may accommodate themselves to our climate.

Mr. Wilder thought that the progeny of species now verging on hardiness might adapt themselves, but said that the *Cryptomeria Japonica* and the *Sequoia*, which were almost hardy enough for our climate, gradually died out. Ellwanger and Barry had a clump of the *Sequoia* which formed the only exception to his statement with regard to that tree, that he knew of in the north. There are very few in Europe, and those at Rochester barely escaped.

The Chairman said that a single instance of successful acclimation would prove more than any number of failures.

Mr. Wilder had yet to learn of a single instance. If there had been one effected by the Paris Garden of Acclimation, he had never heard of it.

Edward S. Rand, Jr. said that his experience agreed entirely with that of Mr. Wilder and Mr. Hovey. He never had a single plant acclimated, and never knew the progeny of a tender plant fertilized by itself prove hardy, but if we could hybridize a hardy plant with a tender one, we should bend our efforts in that direction, and he cited as a most valuable result from such a union the

beautiful hybrid rhododendrons, which are perfectly hardy in New England.

Mr. Rand went on to speak of an orchid exhibited by him, which was received from Hugh Low & Co. for *Cattleya Trianæ*, but which he thought probably a hybrid between that and *Cattleya Mossiæ*, uniting the characteristics of these two beautiful species. This was only an example of what might be expected when we get to importing orchids in large quantities.

James Cruickshanks remarked that no one had yet succeeded in making *Epigæa repens* look well in cultivation. William Cobbett went home with the idea that he should have no difficulty in the cultivation of Indian corn in England, but though he started the seed in a hot-bed he only got ears of the size of his finger.

Mr. Rand said that he had been successful in growing the *Epigæa repens* in his rhododendron beds, but that Mr. Cruickshanks was right as to its culture in ordinary garden soils.

MEETING FOR DISCUSSION.

SATURDAY, February 19, 1876.

William C. Strong, Chairman of the Committee on Publication and Discussion, presiding.

The Chairman announced the offer of the following prizes, of twenty-five dollars each. First, for the best Essay upon the Culture and Varieties of Roses. Second, for the best Essay upon the Culture of Flowers and Foliage for Winter Decoration and for Market, with a list of the most desirable varieties. Third, for the best Essay upon the Culture of the Squash and Melon, with a list of the best varieties. Fourth, for the best Essay upon the Ripening and Marketing of Pears. Fifth, for the best Essay upon the Improvement and Ornamentation of Country Roads.

No paper was provided to open the meeting, but the Chairman remarked that the many flowers on exhibition suggested much that might be learned. In particular, the very fine hybrid perpetual roses, exhibited by Mr. Comley, incited the wish to know

how they were grown, and he called upon Mr. Hovey for some remarks.

C. M. Hovey said that forcing this class of roses was no new experiment here, though few had been exhibited until last year. To force roses to advantage we must have plenty of room; it cannot be done successfully in the same house with a mixed collection of plants, though it may be with those which require a light temperature. The first point is the preparation of the plants; if this is attended to, and a proper temperature maintained, there is little danger of failure. Two essentials are plenty of water and manure. It may be said of roses, as a well-known English rosarian said of strawberries, that what they need is the pump and the manure pile. We have on exhibition to-day plants eight months from the cutting, with only one bloom on each. But it would hardly pay, in a commercial way, or scarcely in any way, to grow a plant so long for a single flower. To be forced profitably, or perhaps he should say to bloom profusely, the plants should first be grown two or three years in the pot or open ground, and they must have constant care, and never be neglected. They should be plunged in the ground during the summer, and in autumn taken up and the wood thoroughly ripened; otherwise they will not form their buds, but will run to foliage when planted in the heat. If the plants are turned out in the ground, the destruction of the root in taking up is too great. When brought into the house they must be kept in a low temperature at first, and not be allowed to grow too rapidly; a few degrees too much heat will ruin all that has been done. They must have plenty of air and water, and be kept free from all insects; and great care must be taken not to injure them in fumigating. They can be grown in the low houses commonly used for forcing, but higher and more airy houses are far better. Mr. Hovey said he knew a gardener, who had been very successful in forcing La Reine and other old varieties, who took up strong plants three or four years old, put them in ten or twelve inch pots, and placed them in a cool vinery, where the temperature fell nearly to freezing at night, giving plenty of air. Here they remained until the young shoots were two inches long, when they were removed to a warmer house to bloom.

E. W. Buswell said that he did not see the necessity for a plant to be two or three years old before forcing. He saw at Mr.

Comley's, newly imported rose bushes which were cut back very severely, potted, and placed in the potting shed. The next year very fine flowers were shown from these plants.

Mr. Hovey said that the plants might be forced when younger, or only one year old, but it would not be profitable to grow a plant for a single bud. The one great object is to have plants with many flowers, and this cannot be done on very young plants.

The Chairman remarked that the question was merely as to the quantity of blooms from a plant. The commercial growers pot their plants.

James Comley said the plants referred to by Mr. Buswell were one year old. Two year old plants would produce better flowers than three year old, but not so many.

Edward S. Rand, Jr., said that he had been quite successful in forcing roses, and that his method was very simple. He had a row of Gen. Jacqueminot growing in the open ground, which at Thanksgiving were taken up and put in his rhododendron cellar, which is kept just below freezing. At Christmas they were brought into the camellia house, and gradually to the warmest end of the rose bed. The plants were now in full bloom; he had had fifteen flowers on one plant; on larger plants he would get more bloom but not better. The plants were now two years old. After forcing he intended to take them up and plant out. He thought this the best way, though Mr. Hovey's might make better exhibition plants.

Dr. G. F. Waters said that the treatment of roses proposed is on the natural order. Success is due to close observation of nature. He had endeavored to set forth the natural method of forwarding the growth of plants. We must make our steps gradual, and, though we might make very little perceptible change, continued improvement would eventually give us a perfect plant. The plant of this year is not the plant of last year, but we have a new system built on the system of the previous year, just as in the development of a coral reef the polyps on the top are new individuals.

Mr. Hovey said that the great interest of these discussions is in the development of the principles on which horticultural operations are based. The Germans, who understand the principles of forcing, always have three houses for the purpose; the first kept at nearly freezing temperature, say 34° to 40°; the second intermediate, from 45° to 55°; and the third warmer, from 60° to 75°.

Amateurs who have but one house do not see the reason why they cannot grow plants as well as anybody. The secret of Mr. Rand's success is in gradually introducing the plants to heat. If too much heat is given at first the flowers will be small. These are principles underlying all the operations of gardening, and if we neglect them we shall fail of success. All forcing must be done gradually; the increase of temperature should be like the increase of temperature in spring, and if we examine the table in "The Garden Almanac," of the temperature of every day in the year, we shall see how very gradual this increase is up to the period of midsummer, and how equally gradual is the fall to midwinter. We must imitate this if we would not fail. We can cause melon seed to germinate in five days, or we can spread out the same amount of heat over ten days, or we can get a growth of cress in twenty-four hours, as Mr. Cruickshanks recently told us he had done, but the best results will be obtained by closely following nature.

Mr. Rand called attention to a plant of *Phalænopsis Schilleriana* exhibited by him, one of the rarest and most costly orchids. It bore a fine spike of flowers, in shape resembling butterflies (whence the generic name), and of a delicate lilac or peach-bloom color. The genus includes eight or ten species, among which are *amabilis*, *grandiflora*, *grandiflora aurea*, *rosea*, *Lowii*, *Lüddemanniana*, etc., and is divided into two classes, the large and the small flowered. The leaves of the species exhibited are beautifully variegated with bars or spots of green and white, the under side being of a dark purple. This was the first orchid, with variegated foliage, known, except *Cypripedium barbatum*, and is the only epiphytal orchid combining beauty of foliage with beauty of flower. It makes two leaves a year; different plants vary in the marking of the leaves, and in purchasing a plant attention should be given to this point as well as to the flowers. The flower stem shoots up rapidly from the base of the plant. The plant shown is the first that has flowered in New England, but Gen. Rathbone, of Albany, has a plant five years old, with leaves nearly a foot long, and which had, at one time, a hundred and eighty-two flowers. It is a native of Java and Manilla, and not susceptible of cool cultivation. Many orchids, especially the Phalænopsids, keep on developing new branches from the flower stem, but the *Schilleriana* is an exception. It is very difficult to

increase, but Mr. Rand said that he should pin the flower stem down round the basket in which it was growing, and possibly new plants might develop from the nodes. Though the Phalænopsids are the most easily fertilized of all orchids, the attempts made in England to produce seedlings have failed, but in their native habitats they are produced so freely that the trees are covered with their beautiful wreaths of flowers. Under cultivation great care is required to see that the soil does not become sour. Mr. Rand said that he lost a large plant of *P. amabilis*, from the water lodging in the crown of the plant. The roots of *P. Schilleriana* are flattened, while most of the other species have cylindrical roots. Mr. Rand thought florists would find it profitable to grow this orchid, as single flowers would add greatly to the effect of bouquets. This plant had been in bloom for three weeks, and would probably continue for six weeks longer. *P. amabilis* flowers from November to May.

Mr. Hovey spoke of a plant of *Phalænopsis Schilleriana* which he saw in the fine collection of the late Mr. Lieneau, of Jersey City, with very beautifully variegated foliage, showing a great variety in the marking of the leaves of this magnificent orchid.

The Chairman thought we ought to appreciate the services rendered to horticulture by Mr. Rand in introducing and exhibiting these rare orchids.

Marshall P. Wilder said that it had often been his lot to introduce resolutions in honor of those whom we had loved in life, and to-day, he wished to pay respect to the memory of the ancient elm on the Common, prostrated by the gale on the evening of Tuesday, the 15th. Though it had lived to a good old age it had at last passed away, but if it could have spoken what tales it could have told of love and patriotism, and of gratitude for the land that we love!

Mr. Hovey said that the Old Elm Tree was associated with his earliest recollections; he remembered, when not more than eight or ten years old, being taken on to the Common on election day, and seeing the rows of booths, and crowds of people assembled, on the holidays of the summer, under the shade of this great tree. Before the young trees on the Common were so thickly planted he had seen this old tree standing alone with a hundred cows resting beneath its broad and shadowy branches. He had a great vener-

ation for beautiful trees, and though he had been obliged to cut down a great many, he never laid the axe to one without a pang of regret. Mr. Hovey alluded to the beautiful avenues of elms planted in Cambridge before the revolution by Mr. Inman, under which he had often reclined in a summer's day, and said that he had a tree on his own grounds for which he felt a great veneration. It was one of the only two living seedlings of the Charter Oak, and was brought to him forty years ago by the late Dr. E. W. Bull, of Hartford, in his carpet bag. If this veteran elm that has just fallen, could only speak of all that it has witnessed for two hundred or more years, what a record it would give! The memories which its fall brought before him were more than he could utter.

Mr. Wilder said that there was a young tree growing very near the roots of the great elm, and that it would be desirable to ascertain whether it was a seedling or a sucker. He suggested the propriety of planting, on this centennial year, a successor to the old tree.

Mr. Hovey thought it would be well to procure a portion of the old tree to make a chair for the president of the Society.

Hervey Davis said he had been informed by the City Forester that the young tree mentioned by Mr. Wilder is a sucker.

James Cruickshanks said that, though not to the manor born, he had a great regard for anything associated, like this old tree, with the history of the country. He lived in Hartford for three years and he now had a highly prized relic of the Charter Oak, and it was a remarkable coincidence that during the week when it was blown down, an oak in which the Scottish hero, Sir William Wallace, had taken refuge, was also prostrated.

Dr. Waters said that the development of a tree depends somewhat on the length of the season. When a tree gets so large that the sap has a great way to travel, the leaves at the ends of the branches do not, in a short season, have time to perfect by their absorbed and elaborated carbon a ground connection for the next year's sap to flow up through, so that no sap goes to those parts which have not had made for them such a connection, and consequently they perish. He thought that if this old tree had been headed in it might have endured for a century longer. Each living bud on a tree is the result of forces of the previous year, and is a possible tree. If the long, dying limbs are cut back to

where full, vigorous buds are developed, a new head will soon crown the tree.

Josiah Newhall said that in his mind there were many associations connected with the old tree. Long years ago there met under it some of the men who fought some of the hardest battles of the revolution, and there the subject of a monument on Bunker Hill was discussed. There he (Gen. Newhall) commanded one of the finest regiments in the state, which was reviewed by Gen. Lafayette. He hoped we might have some memento of the old tree.

Rev. A. B. Muzzey said that the loss of this old tree comes very near to our hearts, as it touches our patriotism, and we should consider, as a Society, whether we can do anything to preserve the lives of such trees. The Washington Elm, at Cambridge, lost a large limb some years ago, and though it has sent out new shoots its life is quite precarious. This tree is worth a great deal more than the old elm on the common, for here Washington first drew his sword as commander in chief of the revolutionary army. Mr. Muzzey said that he secured a portion of the broken limb, which he regarded as among his most precious treasures. A few years ago fears were entertained that the tree was near its end, and he asked whether any one could do anything to extend the term of its life.

Mr. Hovey did not agree with Dr. Waters in regard to lopping off large limbs, to resuscitate an old tree. Artificial culture requires the use of the knife, but it is a question whether all pruning does not shorten the life of the tree.

The President had requested him to say something of the azalea, of which we had many fine specimens exhibited. He called attention to a seedling of his own, a hybrid between *Azalea amœna* and *A. indica*, of very dwarf habit, resembling *A. amœna* in that respect. His object was to get a plant with the habit of *A. amœna*, and flowers as large and finely striped as those of *A. Indica*.

MEETING FOR DISCUSSION.

SATURDAY, February 26, 1876.

Rev. A. B. Muzzey, of the Committee on Publication and Discussion presiding.

The Chairman congratulated the meeting that, notwithstanding the severe weather, we had to-day, as on previous occasions this season, a very fine display of plants and flowers, and called on exhibitors for some account of their various contributions, and their methods of cultivation.

Marshall P. Wilder said that all his horticultural life he had been hybridizing the azalea and camellia, in the hope of producing improved varieties, and as he could not expect to remain here many years, he had been desirous to bring his seedlings into flower in as short a time as possible. Two years ago he promised to produce seedling camellias and azaleas, from seed then germinating, some of which should be in flower at this time, and now he exhibited two grafted azaleas, one of which was in flower, and the other would be abundantly in bloom another year, and an ungrafted seedling camellia, of the same age, in bud, besides a grafted specimen. Whether or not it would pay to take so much trouble to bloom seedlings early was not the question; his purpose was to show that it could be done. The stocks of the azaleas were the common *A. Phœnicea*. The seed was sown December 11, 1873, and came up in March, 1874, so that the flowers were produced in less than two years. Mr. Wilder said that he visited his greenhouse every morning, before coming into town, and again every afternoon, and saw that the plants were regularly watered and cared for. The cause of the early flowering is the grafting into older stocks, the principle being the same as is applied to the early production of new seedling fruits.

E. W. Buswell remarked that the Messrs. Clapp had caused their new seedling pears to fruit much earlier than they would otherwise have done, by inserting grafts from them in the branches of old trees.

Charles M. Hovey said that in dealing with all horticultural questions we must be governed by principles. It is not often that we see seedling azaleas brought into bloom in two years. They generally require from four to twenty years. He had a camellia from fifteen to eighteen years old, which only flowered last year—a very vigorous plant with fine foliage. He had raised a seedling rose from Gen. Jacqueminot, sowing the seed in December, and the plant flowering in May, though roses do not commonly flower under one or two years. One of the first persons to experiment in accelerating the production of seedling fruits and flowers was

the late Thomas Andrew Knight. He has recorded an experiment with a seedling camellia which grew very tall and vigorous without blooming, and which he bent down and twisted, and inarched on itself, for the purpose of bringing it into bloom, but without success. All trees, said Mr. Hovey, require a certain period of time to perfect a certain kind of sap. Some require more time than others, the Bartlett pear fruiting on young trees at four or five years from the bud, and on grafts in old trees in two years, while the Dix requires fifteen or twenty years to commence bearing, and then gives only a few pears from the top of the tree, and does not come into full bearing until about five years later. The Harvard requires about twenty years, and the Urbaniste from fifteen to twenty, except when grafted on the quince, which acts on it like premature old age. The plan adopted by Col. Wilder was attended with too much labor and expense to be carried out on a large scale. It would not pay nurserymen to graft five hundred azaleas to accelerate their bloom, the greater part of which must be thrown away as worthless. His method was to winter the plants under the greenhouse stage, placing them out doors in summer. Inarching requires much room and considerable care, and is now seldom practised, grafting the young wood being substituted. When plants are forced by using manures or fertilizers, in any considerable quantity, to accelerate the growth, the flowers are injured in form and substance.

Mr. Wilder said that Mr. Hovey had stated very clearly the principle that maturity is requisite to enable a plant to produce flowers and fruit. Nevertheless, Mr. Knight was mistaken in the opinion that a graft could not be made to produce fruit before the seedling from which it was taken, as we have proved over and over again. He agreed with Mr. Hovey as to the economical principle involved in his experiments, but he was desirous to see, as early as possible, whether he had among his seedlings anything better than we previously possessed.

Mr. Hovey said it was well to bear in mind that it had been taught that plants raised from cuttings, a process analogous to grafting, would not produce flowers sooner than seedlings, but this was disproved by Dr. Dix, who raised a double white camellia from a cutting. Some of Mr. Hovey's seedling camellias, the Anne Marie Hovey and C. M. Hovey for instance, were from five to ten years old before flowering. The tops of the young plants

many years ago, when grafting was not as well understood as now—before we had studied the works of the French, who have carried the art to such perfection—were inarched on old plants. Now he has cuttings blooming in from two to three years, as quickly as a graft and even earlier. After a time, cuttings from old plants seem to retain the properties of the old plants.

E. S. Rand, Jr., said that the only seedling azaleas he had raised were hardy varieties, which flowered in eight years from the seed.

Mr. Rand exhibited a plant of *Odontoglossum pulchellum*, and said that the different species are natives of the cool slopes of the Andes, where at night frost not unfrequently rests on the leaves, some being found at an elevation of 10,000 feet. When first discovered, the plants were carried to England by the ten thousand, but probably not one of those imported from 1830 to 1835 is now alive. They were destroyed by being subjected to the same heat as East Indian orchids. The great difficulty in growing them here will be the heat of our summers. They may be grown in a greenhouse where the temperature falls to 45° at night, along with pansies and camellias. As each pseudobulb, of the species exhibited, annually produces two, it is rapidly propagated. Its season of growth ends in August, when it should be kept dry until December and afterwards kept cool. The plant shown had been in bloom for five weeks, and had been kept in the hall of Mr. Rand's dwelling house, where the temperature fell to 45° at night. The flowers are fragrant and graceful, and might be profitably cultivated by florists, as they can be grown as easily as the lily of the valley.

Mr. Hovey exhibited specimens of the fruit of *Eugenia myrtifolia*. He stated that it was a very ornamental plant belonging to an important genus, of which the common allspice, *E. Pimenta*, is a species. The fruit is eatable and quite pleasant, forming an agreeable variety for the table. The fruit of *Eugenia Jambos* is larger and more eatable. All the species are beautiful plants, nearly related to the myrtle, and resemble that genus both in foliage and flower. The flowers of *E. myrtifolia* are borne in profusion all summer, and though it would require many plants to produce any quantity of fruit for eating, it is borne so abundantly as to be very ornamental on the tree. When pinched into pyra-

midal form, like the azalea, it makes a very handsome plant, and is so hardy that it might almost be kept over winter in the cellar.

The effect of the winter just past, on fruit and other trees, was then brought up, and in answer to an inquiry whether any observations had been made on this point, Robert Manning stated that he had examined some peach buds, which, near the base of the shoots, appeared entirely uninjured. Those on the upper part of the shoots exhibited a general discoloration, but none showed the distinct black speck which is so well known as indicating the destruction of the embryo. Some persons held that whenever the mercury fell to —10° the peach buds were all destroyed, but though his thermometer had marked —12°, he thought a sufficient number of the buds were uninjured to afford a good crop of fruit.

Henry F. French said that A. J. Downing stated many years ago that peach buds would be destroyed whenever the temperature fell to —10° or —12°, but he had often observed that they survived a cold of —20° to —25°. In a dry soil the growth stops earlier and the wood ripens earlier, and hence is less liable to injury. Mr. French asked whether any one could account for the bursting of apple trees. He thought it might be caused by the freezing of sap. It is well known to wood choppers that trees do freeze to the heart in severe cold.

Mr. Wilder said that fruit trees in his ground split open in consequence of the severe cold the last of November, 1875.

Mr. Hovey said that in the winter of 1856 and 1857 the thermometer fell to —20°, and pear trees were injured both in the bud and wood, while most peach buds were uninjured. Much depends on the condition of the tree, as well as the severity of the cold, both preceding and succeeding zero weather. When peach buds are killed, the cause may be found in some peculiarity of the winter. Trees will often resist a single freezing when they cannot survive two or three. Azaleas when frozen may be recovered by careful treatment, thawing slowly and in the dark, but if frozen a second time the plant will be severely injured or destroyed. Sometimes the temperature falls to —15° or —20°, followed by a mild rain, and a second or third change to zero destroys the fruit buds. The sap appears to be liquefied by the heat, and the succeeding cold acts mechanically and splits the trees. Mr. Hovey instanced a row of lime trees on Boston Common, which in

winter crack open to the width of from a quarter to half an inch, but close up again in summer. The wood of this tree has large, open vessels. He had observed a remarkable difference between the abele and the white maple during winter. While the buds of the latter swell in warm weather and contract on the return of cold, those of the former continue to grow larger and larger, indicating continuous root action. We know that the catkins of the hazel frequently appear in November. These facts indicate that something is obtained from the ground even during the most severe weather. Mr. Hovey did not know why root action might not go on even when the ground was frozen. It had been thought that rhododendrons were injured by excessive evaporation during very dry weather in March, accompanied by high winds when the ground was frozen, so that the roots were unable to make good the loss of moisture sustained by the top. But this is merely supposition and has not been shown by careful experiment to be true. There can be little doubt that there is a movement of sap throughout the entire year.

The Chairman suggested the subject of Noxious Insects as important and interesting for discussion at a future meeting.

BUSINESS MEETING.

SATURDAY, March 4, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President Parkman in the chair.

This being the time ordered for the election of Recording Secretary, the Recording Secretary announced that the notice had been duly given, and on motion the polls were opened at five minutes past eleven, to remain open thirty minutes.

The Executive Committee reported the acceptance of the resignation of William Gray, Jr. as Chairman of the Committee on Gardens. On motion C. M. Hovey, William Gray, Jr., and John G. Barker were chosen a committee to nominate a candidate to fill the vacancy in the Garden Committee.

HENRY W. PUTNAM, of Salem,
SAMUEL W. TWOMBLY, of Winchester,
D. L. MILLIKEN, of Maplewood,
JAMES LAWRENCE, of Groton,

being nominated to the Society by the Executive Committee, were elected to membership.

The polls for the election of Recording Secretary were closed at thirty-five minutes past eleven.

The Chair appointed C. M. Hovey, J. W. Manning, and William H. Spooner a committee to count the votes. The Committee reported the

Whole number of votes, . .	41
Robert Manning had . . .	40

and was elected.

Marshall P. Wilder, Chairman of the Committee on the Centennial Exhibition, reported that he had been in correspondence with the authorities of the exhibition, to establish the number or quantity of specimens which should be exhibited of the different kinds of fruit, and that until this point was fixed, which he trusted would be soon, the Committee would be unable to issue their circular inviting contributions.

Meeting dissolved.

No separate meeting for discussion was formally organized, but while waiting for the closing of the polls Charles M. Hovey exhibited some seedling azaleas and made some remarks in continuation of the subject discussed the previous week. One of the azaleas was a seedling six inches high and just two years old, showing a single flower, while a smaller plant of Bijou de Paris was raised from a cutting, and bore a flower. Mr. Hovey said that he commenced raising seedling azaleas in 1835, and since then had raised them in large numbers, and that as a rule seedlings did not flower near so early as grafts or cuttings. These azaleas were of the *Gledstanesii* or *lateritia* type; while those shown by Mr. Wilder, the previous week, were of the *Phœnicea* type. We can see no reason why a seedling plant should not come up and bloom immediately, but experience shows us that it must arrive at the age of puberty, and that it requires the formation or storing up of a peculiar kind of sap.

Mr. Hovey also exhibited a camellia cutting two years old, in flower, taken from an old plant, and confirming the inference drawn from the azalea cutting, that by propagating from cuttings of old plants we can accelerate the production of flowers. It is a great satisfaction when we can accelerate the flowering of seedling plants, so as to judge of their merits earlier.

Marshall P. Wilder exhibited a flower of azalea Marie Le Febvre, and said it was remarkable how from the original *Azalea Indica* such large flowers as these were produced. The first importation was *A. Indica alba*, and the wonderful development that had resulted from it by hybridizing, was the strongest inducement to continue the practice. We get such things by hybridizing, as Nature herself never thought of. He did not believe that Adam in Eden had such flowers as these. He began low down.

Mr. Hovey said that once in a while Nature steps in and produces something surpassing all that man can accomplish, and instanced the Duchesse d' Angouleme pear, which was found growing wild in a hedge in France. In such productions Nature seems to surpass herself.

Mr. Wilder did not believe that the Duchesse d' Angouleme pear grew up without being naturally impregnated by the bees or wind, or that Van Mons could have practised on his own theory, for natural impregnation would continually have interfered with it.

Mr. Hovey remarked that Darwin was not the first to suggest the theory of selection, for Dr. Van Mons' theory was essentially a theory of evolution and development.

Dr. G. F. Waters expressed the opinion that the small size of the pots had something to do with the early flowering of the azalea and camellia exhibited.

Mr. Hovey said that the smaller the pot, consistently with the health of the plant, the sooner the plant would bloom. To cramp the roots, without stinting, brings early maturity, like the quince stock, where the sap vessels are smaller than those of the pear graft, causing an enlargement just above the point of union. Precisely the same effect is produced by ringing, but he had noticed that when a branch of the Dix pear, which is noted for its late bearing, was girdled to cause it to produce fruit, it seemed to grow over more rapidly than other varieties. In producing seedlings he had always acted on the principle that checking the growth of

the plants by keeping them in a small pot, has a tendency to cause them to flower at an earlier period.

Mr. Hovey spoke of the clematis as deserving more attention than it had received here, and alluded to the *Jackmanni* type and other improved forms which have recently been produced in Europe. *Clematis Fortunei*, a double white variety, had flowered and produced seed abundantly with him, and a specimen of the progeny was exhibited. It had a lavender colored flower with seven or eight petals, resembling the original type. He thought we could produce varieties here as good as the improved European kinds, such as *Rubella*, *Jackmanni*, Prince of Wales, etc.

In answer to an inquiry by Henry F. French, Mr. Hovey said that the habit of the flower exhibited was the same as that of our native species; it is hardy and grows rapidly.

J. H. Woodford asked how long the seed was in germinating.

Mr. Hovey replied that it was sowed as soon as ripe, in August, and some germinated in January and February, while others laid in the ground a year before the plants came up. It was planted about three years ago.

President Parkman said that some species take longer to flower than others. The specimen exhibited seemed to have returned to the *patens* type, but to have inherited from its parent a tendency to come double. He thought the single varieties more beautiful than the double. He had raised a large number of seedlings, and in England so many had been raised that the market was glutted, a single nurseryman having received from the originators two hundred new seedlings. Sometimes, however, we got something so superior that it is worth while to attempt raising seedlings. *Clematis Jackmanni* was a cross of *C. lanuginosa* and *C. viticella*— the latter having a smaller flower with four petals, and in some of the varieties being very dark colored. One of the best of these varieties is *Hendersoni*, which blooms freely and is very hardy, and was probably used by Mr. Jackman to cross *C. lanuginosa*. *C. Jackmanni* sometimes comes with four petals like, *C. viticella*.

Mr. Hovey remarked that the varieties with but four petals, though producing a fine effect in a mass, were not so beautiful as individual flowers, and we should now, with improved sorts, reject those with only four petals, unless remarkable for color, and retain those with five, seven, eight, or nine petals, which are circular in form, and beautiful as single flowers. He sowed the seeds in a

pot and placed them on a shelf in the propagating house or under the stage till they showed signs of growing. Many seeds were ruined by alternate drying and watering, causing them to rot. They should have moderate and even warmth, and never be very wet or very dry. Seeds of lilies kept in an even temperature in a cool shady place, come much better and more regular than when exposed to alternations of heat and cold or wet and drought.

MEETING FOR DISCUSSION.

SATURDAY, March 11, 1876.

William C. Strong, Chairman of the Committee on Publication and Discussion, presided, and congratulated the meeting on the beautiful exhibition in the hall, which could not but be an incentive to others to cultivate such flowers. He felt confident that the public would catch the enthusiasm in floriculture, which led to such increasingly beautiful exhibitions. In the absence of any special essay, he called on the exhibitors to say something of their various productions.

Marshall P. Wilder, alluded to the many beautiful azaleas exhibited by himself and others, and said that perhaps no plant had been improved more than this. The improvement was due to a knowledge of cross fertilization, bringing together the best parents so as to produce not only beautiful flowers but plants of good habit. A plant with gross foliage and robust habit, but diminutive flowers, presents an incongruous appearance. In crossing, we should select varieties possessing the characteristics that we desire to combine. The camellia has been equally improved with the azalea. Mr. Wilder thought there was a point beyond which we could not go in improvement, and that we should never see any finer flowers of the camellia and azalea than now exist, but there were a multitude of other things that could be brought up to the same standard, and we may see other forms of flowers and expressions of color in those species which have been most improved by art.

The Chairman said that the attention of every one entering the

hall would be arrested by the stand of perpetual roses exhibited by James Comley, and he had no doubt that it was in the mind of many gentlemen that they would cultivate perpetual roses. So many of the contributors of flowers remained in the hall that it became a question whether we should not be obliged to follow the exhibition to the other room. He wished that Mr. Comley were present to give us some information concerning his method of forcing roses, but as he was not he called upon C. M. Atkinson to tell us something about a plant of *Thyrsacanthus rutilans* exhibited by him.

Mr. Atkinson said this plant belonged to the order *Acanthaceæ*, and was introduced from South America about twenty-five years ago. It is a half shrubby plant, producing great numbers of brilliant crimson, tubular flowers, attached near the ends of long, slender, branched, drooping flower stems, giving the plant a very graceful appearance. It is propagated by cuttings, and is one of the most easily cultivated of warm greenhouse plants. It requires a temperature of about 50° at night, and plenty of water. He had found it very useful for table decoration, the trusses of flowers being so arranged as to droop from the cups of a branching flower stand. The plant exhibited had been in flower for three weeks, and would continue certainly a month longer. It was about twelve months old and four feet high.

Mr. Atkinson also exhibited a branch of *Philadelphus coronarius*, in flower, from a plant which he had brought into the greenhouse to make cuttings from, desiring to increase his stock so as to plant a hedge. It was brought in at about the same time with the deutzias, and the plant, which was three feet high, was now covered with flowers. He thought it would be valuable for forcing as a flowering plant.

Charles M. Hovey thought that it would require too much room to force the *Philadelphus;* if, however, a gentleman had plenty of space it would be desirable, but they could not be raised in the low houses commonly built now for forcing. The weigelia and similar shrubs, are also frequently forced, and are very beautiful. It is considered by gardeners more of a feat to force some of these things out of season than to grow tender plants in season. All these forced shrubs add variety, interest, and beauty to every collection, but as a matter of profit, estimated by their money value, there is little in it. This, however, should never be connected with real art.

E. W. Buswell thought that more might be done in the way of forcing hardy flowers than is now, and instanced some blooms of *Hemerocallis flava* on exhibition. He believed that if more attention were given to ascertaining the adaptability of hardy things to forcing, many beautiful flowers would be found eligible.

Mr. Hovey read from "The Garden," Vol. IX, p. 185 (February 19, 1876), in the weekly calendar of operations, directions to "introduce into the forcing houses, from time to time, a few plants of a hardy nature, such as rhododendrons, azaleas, deutzias, lilacs, weigelias, sweetbriars," and plants of that class, showing that it was a common thing in large private establishments. In England these plants are considered more important and often more attractive than others of far greater value.

Mr. Atkinson, being called on by the Chair to give some information in regard to forcing roses, said that few of us had seen better roses than those shown by Mr. Comley. The rose, or any other plant, to be forced successfully, must be *in condition*, which means a great deal with plants, as well as with horses. The object of the cultivator should be, by careful preparation to bring them into proper condition for forcing. They should not be left until they have to be pried out of the ground with a crow-bar. His practice was, not to neglect the plants after forcing, but to look to them carefully and keep up the growth, and if we do this there is no reason why we should not have as good roses as Mr. Comley's. The great drawback is that the wood does not ripen, and the cardinal point of success is to get the plant into good condition, with well ripened wood. If you have a spare house, or a spare cold frame, the best way is to bring them on gradually. He had a neighbor who places them in a cold vinery, and whose plants were now a solid sheet of bloom. He plants them out in summer and lifts again in September, subjecting them to a little frost—just enough to kill the foliage. The best soil is a heavy one; not a clay, but a good, stiff loam, with a little well rotted cow manure and a little sand. The roses exhibited are called Hybrid Perpetuals, but the Noisette, Bourbon, and China roses are so much mixed now, that it is difficult to distinguish the blood of the different classes.

Mr. Hovey corroborated what had been said by Mr. Atkinson, and added that it was of no use to undertake to cultivate such plants in a mixed collection. The most careful preparation would

be of no avail if they were placed at once in too much heat; there would be plenty of foliage and red spider, but few roses. He would take up in September, place in a half shady situation, and have them judiciously watered, and then the foliage would assist the growth of roots. Roses seldom lose their foliage until the last of October, and we occasionally see a flower in November, and when managed in this way the plants have two months to grow. To be forced successfully there must be a cessation of growth and a ripeness of the wood. As the nights become cool the leaves turn yellow and the wood ripens gradually. The means of ripening are withholding heat and water. It would be foolish to leave the plants in the ground until a crow-bar was required to dig them up. You might as well attempt to force a crop of grapes by raising the temperature at once to 80°, as a crop of roses.

The Chairman said that the foliage, if sustained by showering and keeping the plant close, certainly did encourage root action. But the question to be decided was whether it was desirable to submit the plant to the action of frost. Strawberries should be exposed to frost before forcing, so as to cause vegetation to cease.

Mr. Hovey thought there was no necessity for exposing roses to frost. It might not injure them, but it would not do them any good. He would not subject even strawberry plants to frost. In California, where they never see frost at all—certainly nothing more than white frost—they have abundant crops of strawberries, pears, and all other fruits.

John B. Moore did not believe that hardy roses could be forced with the best success when planted in the ground in summer and taken up in autumn, but would keep them in the pots. He had exposed his to frost severe enough to burst some of the pots, and now had plants with thirty buds on each. They were placed in a cold frame and the pots covered with leaves to the depth of six inches, and remained there until quite cool weather. Neither did he believe that they needed a separate house, for he had grown them in the same room with smilax, tea roses, pelargoniums, etc. They could be grown as Mr. Hovey and Mr. Atkinson had stated. Mr. Comley grew his in pots, and the tops had all been exposed to frost. While he did not believe that freezing the soil in the pot would do any good, in his own case it had certainly not done any harm.

Mr. Atkinson said that Mr. Nelson, the neighbor of whom he

had previously spoken, had forced roses for fifteen or twenty years, and when turned out of the pots the roots are a mass of fibres. He knew that they could be forced when turned out. He knew a man who forced from five hundred to a thousand plants yearly.

Mr. Hovey read the notes of his remarks at the meeting on the 19th of February, in which he stated that the plants should be grown in pots to ensure the best success, and said that if they had been planted in the ground and were to be taken up, it should be done in September. Mr. Paul, the English rose grower, had shown a plant with two hundred blooms, and he kept them for fifteen years in pots. Undoubtedly they can be grown successfully by potting in autumn. Mr. Nelson's plants were finer than any that have been shown here, and he plants out. Mr. Hovey thought that those who are not proficient would do better to plunge and shift their plants, and bring on a perhaps premature ripeness of the wood.

The Chairman asked, Why not ripen the wood earlier, by withholding water, so as to start them earlier? He had supposed that frost was a more desirable element than the gentlemen who had spoken appeared to think.

Mr. Atkinson said that ripeness of wood is an indispensable condition. Drought and frost have the same effect. In California the only way they can ripen their wood is by withholding water. Cold and heat have the same effect on vegetation. A rose which has produced such flowers as are exhibited to-day, has made three-fourths of its growth. He had roses with shoots fourteen or fifteen inches long, and if these were not taken care of after flowering, there would be but a small show of bloom another season. He would say to any amateur beginning to force roses, that if he did not get an abundance of flowers the first year he should not be discouraged.

E. W. Buswell asked whether *Deutzia gracilis* could be forced without being subjected to a season of frost.

Mr. Wilder said he had forced them when they had been only subjected to a slight frost, but they would have done better if they had been frozen thoroughly so as to put the plants entirely at rest.

Mr. Hovey thought the subject was somewhat in doubt. It is very difficult to establish what is successful cultivation. He had a hundred deutzias which had not been out of the pots for five

years, except to be repotted. They are placed out doors after blooming, as soon as can be done with safety, and in August such as need it are repotted and others are top dressed. They are only exposed to frost enough to take off the leaves.

Mr. Buswell said that the point which he desired to ascertain was whether hardy plants would not give more satisfactory results when forced, if first subjected to such treatment in regard to freezing as nature gives them.

Mr. Hovey thought that they would not. His plants begin to lose their leaves early in September, and often have lost all their foliage before severe frost. He would not subject them to frost were it not to keep them back. Perhaps some of them got frozen through, though he took especial pains that they should not, by throwing a few leaves over them, as freezing hard would break the pots, but he saw no difference among them which he could attribute to freezing. He never put a plant into the house that to his knowledge had not been exposed to frost at all, but thought it would neither injure nor benefit them.

Mr. Buswell was still of the opinion that plants would force better if we could supply all the conditions under which they naturally grow.

Mr. Wilder thought frost for the tops was advantageous because it puts the plants to rest.

Mr. Buswell said that there was more or less activity in the sap in the roots of plants even when frozen, and asked whether the activity might not be so great, when not frozen, as to interfere with forcing.

Mr. Atkinson did not believe in frost; he took up all his plants while still in foliage, and syringed. Possibly they might have got some frost. Every year as soon as they had ceased flowering he took care to remove all the old wood.

The Chairman said that no gentleman had taken the position that frost is absolutely necessary. In a cold climate, snow falls early and the ground is not frozen. Yet it seemed to him that there was an advantage in a moderate frost. It is a method provided by nature for ripening the wood. We are obliged to work in a short time, and the slight freezing gives us the desired effect. He was engaged in some experiments which he hoped would enable him to pronounce a positive judgment on the point. He had taken plants that had been forced, and by artificial means

subjected them to frost in August, for the purpose of putting them to sleep and giving a more perfect rest than by merely drying, so as to force again in November or December.

MEETING FOR DISCUSSION.

SATURDAY, March 18, 1876.

W. C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The following paper was read by the Professor of Botany:

THE HERBARIA OF THE MASSACHUSETTS HORTICULTURAL SOCIETY.

BY JOHN ROBINSON.

At previous meetings of this Society, the subject of forming an Herbarium has been occasionally mentioned, and the hope expressed that at some future time such a collection would be made. While looking over, this winter, the various dried plants that have from time to time been presented to the Society, some members of your Committee suggested the propriety of having these collections arranged and made available to the members for reference. It was also thought desirable that a report should be prepared, stating what these collections were, with suggestions as to their improvement. I have carefully examined the several packages, with the assistance of the Secretary, who has given me the names of the donors and the dates of presentation, and find them to be as follows: —

No. 1. From Giuseppe Monarchini, M. D., U. S. Consul, Island of Crete, a Corresponding Member of the Society; May 3, 1851. A collection of plants from Crete, consisting of some fifty species, mounted on twenty sheets of paper partly, named, but not systematically arranged.

No. 2. From "A Lady in Roxbury," August 9, 1851, as well as can be determined. This "collection of flowering plants and grasses," as the report in the TRANSACTIONS of the above date designates them, consists of some ten sheets, arranged with a

greater view to the artistic effect than to their horticultural or botanical use.

No. 3. From Mrs. Isaac Clements, Mechanicsville, Saratoga Co., New York, March 1st, 1856. A collection of native plants, of about sixty species, probably collected at the above mentioned locality, mounted on small sized paper. The specimens, except that in most cases they are fragmentary, are quite good. It appears that the Society awarded Mrs. Clements a Silver Medal for this collection.

No. 4. Three collections, made by Dennis Murray, of Roxbury, a member of the Society and a frequent exhibitor of native plants at its rooms, presented by his daughters, November 9, 1864, after his decease.

A. One of flowering plants, collected chiefly near Boston, of about one hundred and twenty-five species, mostly in good order, mounted on paper smaller than the usual size, of a quality too thin to be serviceable.

B. A collection of Vascular Cryptogams (Ferns, Equisetums, Lycopods, and Selaginellas), about eighty species, and some duplicates. These are from America and Great Britain; the American chiefly from New England and the Middle States. Many of the species represented are quite rare, and the specimens are generally good. They are not systematically arranged, are mounted on paper above the usual size, and are adorned with various borders of fancy and high colored paper, quite out of place in so excellent a collection.

C. A collection of grasses, comprising some sixty of our native and introduced species. The specimens, which are remarkably fine, are mounted on various colored papers, but in such a manner that they might be easily transferred to a paper of proper quality and size. Most of the species are named and the place of collection given.

No. 5. Donor and date of presentation unknown. A collection of about thirty native and garden species, mounted on some twenty sheets; the specimens are in fair condition.

No. 6. From George E. Davenport, June 5th, 1875, the collection of American Ferns, which was properly noticed under the above date in the TRANSACTIONS of the Society. Mr. Davenport has since then added some new species and improved others, and, as stated at the time of presentation, this is one of the best and most complete collections of American ferns extant.

So far as I can learn, the above comprise all the collections of dried plants that have ever been owned by the Society. At one time some casts of fruit, which might be considered as coming under the head of the Herbarium, were purchased, but proving unsatisfactory and of little use, they were deposited elsewhere.

In order to form some idea of the expense of collecting and caring for a collection of dried plants, I have obtained a few data from those in charge of the Gray Herbarium at the Cambridge Botanic Garden. This collection, which is not yet complete, comprises over 250,000 specimens of flowering plants, besides the Sullivant collection of mosses and plants of some other orders. It requires a room as large as the Library Room of this Society for their proper arrangement, besides two or three smaller ones for work-rooms. It requires the constant labor of about three persons, one of whom must be an excellent descriptive botanist, and the cost of the paper used would alone amount to a large sum, which with salaries and contingent expenses, would be increased to fully four thousand dollars a year. The collection of the Boston Society of Natural History, though very much smaller than the Cambridge Herbarium, requires the work constantly of one person. The herbarium at Kew, England, is the largest in the world, and that at Cambridge the largest in America.

Every plant in an herbarium must be poisoned to prevent the ravages of insects, attached to the paper upon which it is to be displayed, and the whole collection must be occasionally examined to ascertain if free from insects and mould. After all this is accomplished, only such persons can be allowed to refer to the collection as are familiar with the use of herbarium specimens, for the slightest carelessness in handling, or the disarrangement of the species, gives endless trouble to those in charge to repair the damage to the specimens or to rearrange the sheets.

We have very near at hand the extensive collection at Cambridge and the somewhat smaller one of the Natural History Society in this city. To these collections, through the kindness of those in charge, the members of this Society have often referred, and without doubt can do so in the future. Inasmuch as this is a society for the promotion of horticulture, and not, except where the two studies intermingle, for botanical work, it would seem inexpedient to undertake, with the present accommodations and requirements of this Society, to collect a general herbarium, especially

when we consider the great expense and the amount of room and care required for its preservation.

The library contains works on nearly every family of plants that is needed for reference, the plates, in most instances, being better, on account of color and perspective, than the dried plants themselves would be, for ordinary identification. The principal needs seem to be works, as yet unpublished, on American Ferns, Grasses, Willows, Asters, Golden-rods, and perhaps a few others of the larger genera of native and foreign plants.

The Society has now a very complete collection of the American Ferns in perfect order. Judging from the frequent reference made to this collection, it seems to form a very valuable addition to the library. It would appear desirable that a collection of native and introduced grasses, for which there is already an excellent foundation, the asters, golden-rods, and willows should be formed. They would occupy but little space, be easily taken care of when once in order, and are all plants which may be readily collected. The ferns and grasses are plants which, when dried, retain nearly all the characters they possess when in a living state; the others retain their characters to a considerable extent, but not so remarkably as the ferns and grasses. Very many plants, often whole families, when prepared for the herbarium would scarcely be recognized by the unpractised eye as being the same species when seen in the living state.

Much has been written and said recently concerning the utility of museums and collections, and the feeling is rapidly gaining ground that something more is necessary than a scientific name attached to the specimen on exhibition. In Europe, according to the reports of their museums, particularly the English, they do not consider it beneath their dignity to place on the labels a full account of the specimen, and at the great South Kensington Museum, the money value of the article on exhibition may be seen. Few of the institutions in this country have done much as yet towards making their collections of educational value to the public, but many are commencing illustrative collections in certain departments, arranged and labelled in a manner to instruct the visitors, even should they be entirely ignorant of scientific matters. A horticultural society can be expected to do but little in this direction, though descriptive labels could be placed on any new or curious plants, particularly our native species when on exhibition,

but in an herbarium much might be done toward this end. Suppose the Society should form a complete collection of the native and introduced grasses, arranged as specimens usually are in an herbarium. Each label might state,

1. The scientific name, with the synonymes.
2. The best English name and the local synonymes.
3. Whether native or introduced.
4. Where it originated.
5. Whether annual, biennial, or perennial.
6. Whether of value as an agricultural or horticultural product.
7. District, climate, and soil best adapted to its growth.
8. If of horticultural value, its uses.
9. If of agricultural value its rate of production per acre.
10. Any other facts or information of value concerning the species.

The following is an example of the label proposed:

1. *Phleum pratense*, Linnæus.
2. *Timothy*. (From Timothy Hanson, an early cultivator.)
2. *Herd's Grass*. (In New England and New York, not of the South.)
2. *Cat-Tail-Grass*. (Of England.)
3, 4. So long under cultivation that the native habitat is in doubt, Gray considering it introduced from Europe; Pickering considering it an American species.
5. *Perennial*.
6. A valuable *agricultural* product.
7. "Thrives best on moist, peaty or loamy soil; not suited to sandy or light gravelly lands." Flint, "Grasses and Forage Plants," 1874.
9. *Yield* of hay, two to four tons per acre; of seed, ten to thirty bushels per acre.
10. A coarse grass, not successful south; very extensively cultivated north.

A collection so arranged would give all the information that a complete book on the subject could furnish. The same thing could be done with other orders and genera where no works are published describing the species. In this manner the herbarium would be made an accessory to the library, rather than a separate department, which, for a society like this, would seem to be the most satisfactory arrangement, and certainly the least expensive.

In case this Society should be presented, which is not improbable, with a collection of any considerable size or value, an arrangement might be made with one of the herbaria in this neighborhood, to deposit it with their collection, thereby improving an herbarium already existing and provided with the proper means for carrying it on. The members of this Society could refer vexed questions to those in charge of these collections, quite as readily as to a partially complete collection in the Society's rooms, and with much more satisfactory results.

Discussion.

Leander Wetherell expressed himself as very much pleased with the paper which had been read, both as to its suggestions and objections. If we should collect a general herbarium we should require an additional building for its accommodation, and the expense would be even greater than was estimated by Mr. Robinson. It is very difficult for those unused to it, to identify plants by herbarium specimens. Schleiden, in speaking of the errors made by British writers on plants, said that any of the authors or editors were competent to correct them if they had gone into the field instead of to the dried specimens. As an illustration of the little knowledge of ferns possessed even by educated persons, and the need of such collections as that presented by Mr. Davenport, Mr. Wetherell said, that last summer he heard two graduates of Amherst speaking of the *flowers* of ferns. He approved of the proposal that we should complete the collection of grasses, of which we have so good a nucleus, and also suggested a collection of heaths. He had a small collection of grasses of his own, which he found very useful in identifying those sent to him for name; they are more valuable than the best engravings. He knew of no department of botany, concerning which there is so much need of information among farmers, as on the grasses. The "blue grass" of botanists is the *Poa compressa*, while the blue grass of agriculturists is the *Poa pratensis*. He went with a friend to Kentucky, to see what the famous blue grass was, and found it the same as the June grass of New England, but growing much more luxuriantly, one stalk being four feet seven and one-half inches in height, while a plot averaged from three to three and a half feet. Brutus J. Clay said the early emigrants were in the habit of stopping at a place called "Blue Licks," and the farmers of Kentucky,

finding the grass which sprang up there an excellent pasture grass, were in the habit of going thither to cut grass for seed, and hence the name of "blue grass." The farmers frequently apply the name of June grass to the *Danthonia spicata* (wild oat grass), sometimes more aptly than correctly called "poverty grass," a very worthless grass, and if we had specimens of both we should see the difference. When the botanist is laughed at for the names which unaccustomed tongues find so much difficulty in pronouncing, he knows that he cannot communicate with certainty what is in his mind to another botanist, without these names.

Dr. W. P. Bolles said that he had been very much interested in the subject before the meeting, and heartily concurred in the suggestion to complete the collection of grasses, but would be very sorry to see the Herbarium limited to these and the collection of ferns. He thought the Umbelliferæ, or Parsley family, was one of which it was very desirable, on account of the difficulty experienced by beginners in distinguishing the species, that we should have a standard series for consultation. He also suggested that we should make an herbarium of native North American plants, which are often known by different common names in different sections of the country. Specimens of even the most common weeds would be very valuable for examination by farmers and horticulturists. He thought the notes of which Mr. Robinson had given an example, very desirable, and in addition to such as might be made by the donors of specimens, would have others by competent persons. He thought an herbarium of the flowering plants of North America would not be beyond the limits of the room or means of the Society. A hundred species, with genus covers, would occupy only about six inches in height.

Edward S. Rand, Jr., thought we were under obligation to the Professor of Botany for bringing the subject before the Society. Though for many years one of the Library Committee, he did not know that we had any specimens beyond the Davenport collection of ferns. Although plates, either colored or plain, are in some respects preferable to dried specimens, there is a knowledge to be gained from the specimens which cannot be got from the plates. Neither can take the place of the other. A small collection of the most desirable plants would take but little room. Our book-shelves are already overflowing, and more room must soon be provided, and as a small collection of the most desirable plants would

occupy but little space, it should be considered in providing room for the increase of the library. He suggested that the Chairman of the meeting should bring the subject before the Society at a business meeting.

Charles M. Hovey regretted that he was not present in season to hear the report of the Professor of Botany, for he had not missed a paper before since these discussions were commenced. He liked to be progressive, and to do what we could for kindred sciences, such as botany and entomology, but thought that if we divided our energies among several branches of science we should accomplish far less than if we concentrated them on the appropriate work of the Society. The London Horticultural Society is now wrangling over the question whether or not it shall go out of existence, and was long since obliged to sell its fine library and herbarium to discharge its indebtedness. This embarrassment Mr. Hovey attributed to the large amount of money (£30,000) spent on its publications, and to its engaging in enterprises not legitimate to the work for which it was established. Mr. Hovey said we should soon have more botanical books than we could accommodate; he thought we had more now than we ought to have, though he was as fond of books as any member, and had more in his library than he had space to accommodate. The Natural History Society had a large herbarium so near that it was not worth while for us to undertake one, and though he would not refuse specimens that might be presented, this branch should be made incidental to the main work of the Society. He had an herbarium of the plants of Cambridge, collected a great many years ago, which he had not looked at for a long time. We should not go into those things which will take up so much room or cost too much money.

Mr. Rand replied to Mr. Hovey, that he failed to see the propriety of the argument drawn from the position of the London Horticultural Society. It was only after the Society had spent too much money for premiums and on their garden, that it went into the projects of which Mr. Hovey complained, in the hope of thereby retrieving its financial position. Mr. Rand differed entirely from Mr. Hovey in regard to the library — he thought we should aim to secure for it every horticultural and botanical publication, and should endeavor to make the herbarium equally complete. He suggested that Mr. Hovey might make a good disposition of his superfluity of books and herbarium specimens by adding to the collection of the Society such as are not already in it.

Robert Manning thought that the value and importance of the central location possessed by the Society were not appreciated by all. Many persons would come here to consult an herbarium, who would not go over to the Natural History Society's building or to Cambridge for that purpose.

Mr. Wetherell added a word in regard to the importance of accompanying the specimens of grasses with such notes as were recommended by the Professor of Botany. In his view these notes would be of great value, which he showed by reference to the *Poa nervata* (now *Glyceria nervata*) or fowl meadow grass (confounded with *Poa serotina*), and said that he went to Professor Gray with specimens of each, and when he inquired in regard to their utility and economical value as farm plants, Prof. Gray replied, that he had no right to ask such a question of a botanist. This set him to thinking which was more useful — the man who understood systematic botany, without any knowledge of the economical uses of plants, or the man who knew the uses of plants but was ignorant of systematic botany, and he concluded, from the practical standpoint, that he would rather be the latter. Mr. Wetherell alluded to the valuable results of the investigations into the utility and cultivation of grasses by the Duke of Bedford, as recorded in the "Hortus Gramineus Woburnensis." He did not agree with Mr. Hovey in regard to books, for it is hard to draw the line between horticultural and botanical works.

Mr. Hovey said, that we should never have had the valuable "Catalogue of Fruits" of the London Horticultural Society, if that society had not given its attention strictly to horticulture. In regard to the library, he did not care how many horticultural books we had. The Linnean Society of London never meddled with horticulture, and he would confine the work of our Society strictly to horticulture.

Dr. G. F. Waters remarked that a short time ago steps were taken by the Boston Society of Natural History to organize a botanical section, and he felt no doubt that at some future time all the departments of that society would be in charge of separate sections.

The Chairman said that so much interest had been awakened in the subject, that, if no one else undertook it, he would bring it to the attention of the Society at a business meeting.

E. W. Buswell mentioned that a plant of *Phormium tenax variegatum* (New Zealand flax), was exhibited in flower to-day for the first time, by Charles S. Sargent. Mr. Buswell also showed a small mat, made from the fibre of this plant by the native Maoris of New Zealand, prepared and woven with no apparatus but water and stones. This was sent in by Miss Hannah E. Stevenson.

The Chairman remarked that the variegated form of the New Zealand flax was one of the most beautiful of all variegated plants.

Mr. Hovey said that the common green variety did not seem to be very generally known. He alluded to Dr. Henry Perrin, who lost his life while endeavoring to establish the cultivation of this and other tropical plants in Florida, many of his letters having been published in the "Magazine of Horticulture," nearly forty years ago. The plant can be grown without protection, as far north as Charleston, S. C., and also in Ireland, where it was grown by a nurseryman for strings, which were made by merely tearing the leaves into strips. Mr. Hovey had used it in this way himself in a half green state, and found it very strong. It might be grown all through the Southern States. It does not require the protection of a greenhouse, but may be kept over winter in a cellar or cold frame. The roots are fibrous, so that it need not be potted. It has a fine effect on the lawn, where it should be associated with yuccas, agaves, and similar plants. Although the variegated form is very beautiful, it was a question whether, if all plants were variegated, the green form would not be considered quite as beautiful. It is novelty which gives value to many plants. The plain green *Phormium*, with its tall, erect, sword-like leaves, is a grand subtropical plant.

Mr. Buswell believed the public taste was running wild on variegation. While some plants, from the breadth of their foliage and distinctness of variegation, were objects of beauty, others were so variegated as to appear at a little distance as if they were dying.

Mr. Robinson remarked that the *Phormium* belonged in the Lily Family proper.

MEETING FOR DISCUSSION.

SATURDAY, March 25, 1876.

W. C. Strong, Chairman of the Committee on Publication and Discussion, in the chair. The meeting was opened by the reading of the following paper:

CHEMICAL FERTILIZERS.

BY HENRY F. FRENCH.

At the request of your Committee I have consented to read at this meeting a paper on Chemical Fertilizers, a subject upon which I claim to have no peculiar knowledge, beyond what may be acquired by any careful observer and reader. I am no chemist, and shall not attempt to speak with scientific exactness. There are certain theories and conclusions, however, in which all modern chemists agree, and which it is well for us to bear in mind in this discussion.

The third edition of "Liebig's Agricultural Chemistry," which I happen to own, was published in 1843. At that time the analysis of plants, and of soils, and of fertilizing agents, with reference to supplying to the soil the elements of plant growth, seems to have been a familiar subject of scientific research. Chemical analysis had already shown clearly of what elements plants are constituted, and that certain of these are derived in abundance from the atmosphere and water, and certain others are derived chiefly from the soil. It had also been ascertained that most soils contained inexhaustible supplies of some of these elements, as, for instance, of silica; and that most soils did not contain enough of certain other elements, as potassa and phosphoric acid, to produce many crops, without restoring, in some form, these essential elements.

It was also well understood that different plants contained these essential elements in different proportions, and consequently that the food furnished them should contain these elements in the proportions in which they were found by analysis to exist in the plants. We find that this idea was so familiar that Liebig and the men of his time, spoke of certain classes of plants as potash

plants, and of others as lime plants. Indeed special manuring, as in the use of superphosphate of lime for the turnip crop has been generally practised in Great Britain for a quarter of a century at least.

Knowing what elements plants must derive from the soil, it was natural enough that chemists should attempt, by an analysis of the soil, to ascertain whether those elements exist in the soil in proportions sufficient to nourish the proposed crop. About twenty-five years ago, in this country, the analysis of soils for this purpose, was advocated by Prof. Mapes, Dr. Lee, and others, as a safe practical method of ascertaining what fertilizers were necessary to be applied for a given crop.

In this direction, chemical science soon found a limitation, as applied to practical agriculture. As an illustration, it was found by actual analysis that a rich soil from the Scioto Valley, was apparently no more fertile than a sterile soil from Massachusetts. The chemist in his laboratory could extract in a single hour from a granite pebble, or from sand, more potash than a plant could extract in a hundred years. It was soon found that, aside from the practical difficulty of procuring for the chemist a fair specimen of a field or a farm, it was necessary not only to consider the physical condition of the soil, but also the condition, chemical or otherwise, in which the fertilizing elements exist.

Equivalents in the chemical laboratory are found not to be always equivalents as fertilizing agents. It seems to be generally conceded that the mineral phosphates of lime, although by chemical tests they appear to possess the same elements of plant food as the animal phosphates found in bone, yet do not produce the same valuable effects upon our crops.

A theory advocated by Prof. Mapes, and supported by some French chemists, is interesting in this connection. It is called "The Progression of Primaries," and is based upon the idea that the elements of plant food increase in value as they progress from the mineral through the vegetable and the animal kingdom. The particle of lime or potassa that is found in the rock is taken up by some plant and becomes part of it. It is then devoured by some animal and becomes a part of the animal, and by and by returns by decomposition to the soil. Having been thus many times assimilated into the higher forms of life, it becomes better fitted for its future round of service, and enters more readily into the

organization of new plants. The theory is certainly plausible, whether founded in truth or not.

Chemistry is indeed limited on every side, however important its contributions to knowledge. The chemist can analyze the grain of wheat and tell us precisely its component parts, but let him take all the elements of wheat, and see whether, with all his science and skill, he can make a grain of wheat, or a quantity of flour, or any of its products. Why, if he knows what wheat is composed of, and the precise proportions of his elements, can he not form the grains; and why, when thus formed, will those grains not vegetate, and grow, and bear fruit? The answer occurs to every reflecting mind. The Omnipotence that formed the grain of wheat, and implanted in it a principle of life and growth and reproduction, is not to be measured by the chemist.

The Life Principle, which guides and controls the plant, from its germ, through every stage of growth, in leaf and stem and flower and fruit, the chemist by subtlest analysis cannot reach. Science cannot tell him why the acorn should always produce an oak, and not a chestnut. No analysis, however minute, can give him a hint even, of what gives its color to the rose, or its fragrance to the violet; or what imparts to one plant its deadly poison and to another its medicinal power of healing. Why the same soil, enriched by the same food, watered by the same dews and rains, breathed on by the same air, and basking in the same sunshine, should yield an infinite variety of form, of size, of color, of perfume, of taste and qualities, is yet beyond the scope of science.

There are certain habits and instincts in plants which to this day find no explanation through science. I once asked a learned professor why is it that the common hop always twines about the pole which supports it, from east to west. Of the fact there is no dispute. Among a million plants there is no exception. My friend, after a little reflection, said he thought it might well enough be accounted for by the attraction of the light of the sun. As the sun rises the plant is attracted toward him, and follows his course toward the west. I replied that his explanation seemed reasonable, and I should like now to have him explain why the bean always twines round the pole in the opposite direction, which you know it always does. He said it was easier to deny the fact than to explain it, and he did not believe a word of it.

What we call chemical affinities and chemical combinations, are

mere names for what we do not comprehend. Phosphoric acid and lime will combine in two proportions only. Two atoms of each form phosphate of lime. Three atoms of phosphoric acid and one of lime form superphosphate. Nobody can tell why they may not as well combine in other proportions. To change phosphate of lime, which is said not to be readily soluble, into superphosphate, we make use of the chemical affinities of the substances. We have seen that in phosphate of lime, the phosphoric acid and lime are chemically combined in the proportion of two and two. They form a sort of equal union or marriage—one bone if not one flesh. Now to break up this union and entice away from the phosphoric acid the lime, which may be regarded as the weaker vessel, we bring into her neighborhood an object of stronger affection or affinity. Sulphuric acid and lime are found to have a stronger affinity for each other than phosphoric acid and lime, and by adding sulphuric acid, we entice away a portion of the lime, forming the new combinations, sulphate of lime and superphosphate. Why these affinities exist, and why these new combinations are formed, it is as difficult to explain, as why one young gentleman and lady have a stronger affection for each other than for all the world beside.

What new combinations take place in the soil after our fertilizers are applied, we can only guess, and many substances produce effects entirely beyond our comprehension. Two hundred pounds of gypsum applied to an acre, ten inches in depth of which will weigh two million pounds, have on some soils produced an almost magical effect; yet I suppose chemistry has thus far failed to solve the mystery. It is thought that the elements that compose gypsum do not enter into the composition of the plants, but its effect is due to its chemical action upon other nutritive elements, probably potash and magnesia, rendering them available to the growing crop. Liebig says that he found by experiment that a solution of gypsum in contact with arable soils underwent decomposition, and formed combinations quite contrary to the ordinary affinities as observed in the laboratory.

Among the ideas most common with those who discuss the growth and feeding of plants is this, that the roots can only take up their food in a form in which it is dissolved in water, and the word *soluble* is usually understood as meaning soluble in water.

Liebig's opinion seems to be this, and it appears to be entirely

reasonable. The roots of land plants are in direct contact with the particles of the soil. A quantity of moisture, but no more than the soil holds by attraction, is essential to growth. The soil holds the elements of food, whether conveyed to it in fluid or other form, and the solution of the solid elements is effected in the pores of the cell walls of the roots, whence they pass into the system of the plant.

We know that stagnant water is injurious to land plants, and so that only so much of the plant food as is *not* carried away by watering is beneficial.

That the elements of fertility, such, for instance, as potash, may be washed out of a soil in which they abound, as potash is washed out of ashes, is well known, but it does not follow that the soil, if of a fertile character, does not retain as much of these elements as is good for the plant. If this is not so, why, in the daily watering of plants in pots, is not all the fertility washed out of the soil, so that the plant should require daily fertilizing as well as watering.

Liebig cites, in support of his theory, the beautiful experiments by Professor Nägeli and Dr. Zoeller, in the Botanic Garden at Munich, in which they grew these plants successfully in a soil containing all the elements of their food in an *insoluble* state. It may be interesting to observe that these experiments were conducted with the three elements and those only, which Prof. Stockbridge uses in his fertilizers, namely, nitrogen, potash, and phosphoric acid. * Indeed Liebig ascribes to the soil itself a power which seems to override and control the chemical combinations by which we endeavor to accommodate what we deem to be the wants of the plants. "The arable soil," he says,† "decomposes all salts of potash, of ammonia, and the soluble phosphates; and the potash, ammonia, and phosphoric acid always take the same form in the soil, no matter from what salt they are derived."

He maintains, as we have said, that plants are by no means limited to such elements as are soluble in water, but that they "possess the power of absorbing their necessary nutritive elements from a soil in which they are present in physical combination, *i. e.*, in a state wherein they have *lost their solubility in water*." ‡ In proof of this, he says a rye plant will yield a thousand fold in a fertile soil, "yet this plant draws its mineral food from a volume

* Natural Laws of Husbandry, page 114. † Ibid, p. 119. ‡ Ibid, p. 118.

of earth, from which the most persevering lixiviation with pure water, or water containing carbonic acid, will not extract even the one hundredth part of the phosphoric acid and nitrogen, nor the fiftieth part of the potash and silicic acid, which the plant has drawn from the soil." * And, what seems conclusive on this point, he says that if plants did receive the food from a solution which might change its place in the soil, the principle nutritive substances must long ago have run away in the brooks and rivers. "For thousands of years, all fields have been exposed to the lixiviating action of rain water without losing their powers of fertility. In all parts of the earth, where man for the first time draws furrows with the plow, he finds the arable crust, or top layer of the field, richer and more fertile than the subsoil." † And although he admits that plants will grow in watery solutions of mineral elements, yet he says they bear no comparison with plants grown in a fertile soil.

Prof. Johnson, of Yale College, examining the statement of Liebig and others, adopts the conclusion that water is capable of dissolving from the soil all the substances that it contains which serve as the food of plants, though I think a careful reading of his discussion of the point leaves the question in great doubt. ‡

In another part of his treatise, he says the roots "supply the plant with large quantities of water when the soil is so dry that it has no visible moisture." § We may add that in California it is not unusual to plant and harvest crops of grain without a drop of rain in the whole season. And in the last page of his book, Prof. Johnson as nearly gives up his position as could well be done, without an absolute surrender. He says in italics, "Those bodies which are most rare and precious to the growing plant, are by the soil converted into, and retained in, a condition not of absolute, but of relative insolubility, and are kept available to the plant by the continual circulation in the soil of the more abundant saline matters." ‖

Enough has been said, in these mere suggestions of the embarrassments attending the investigation of the subject of chemical fertilizers, to render us cautious in our examination of the claims of any supposed new theory of chemical plant feeding. The attention of the civilized world has for a generation, at least, been

* Natural Laws of Husbandry, page 109. † Ibid, p. 108.
‡ How Crops Feed, p. 316. § Ibid, p. 212. ‖ Ibid, p. 375.

called to the subject, by men of the highest scientific attainments, and careful and long continued experiments have been conducted by those most capable of affording accurate results. In our own State, we have at the present time, almost forced upon our attention, the claims of a new series of fertilizers, to which at the request of your Committee, I propose to give some attention.

THE STOCKBRIDGE FERTILIZERS. — These fertilizers are offered to the public under circumstances so extraordinary as to challenge the attention of agriculturists everywhere. Mr. Stockbridge is Professor of Agriculture in the Massachusetts Agricultural College. His experiments have been conducted upon the college farm, and his report on the subject occupies twenty-three of the seventy-nine pages of the annual report of the college made to the Legislature in January, 1876. The president of the college alludes to the professor's valuable discoveries and says, "For the continuation of his investigations the professor ought to have $1,000 per annum for ten years." Prof. Stockbridge announces in the college report that he has "received a United States patent, covering the right to manufacture and sell fertilizers prepared according to these [his] formulas."

The new report of the Board of Agriculture, for 1875–6, contains, in a lecture by Prof. Stockbridge, substantially what the Agricultural College report contains, and so at the public cost, if not under the express sanction of that Board, the claims of the Professor are laid before the people. It is due to the Board of Agriculture, and its learned Secretary, to say that their report shows no official sanction of the claims of Prof. Stockbridge, nor indeed any allusion to them, except that his lecture at a public meeting forms a part of their report.

It is unfortunate that a patent has been taken for these formulas, because, if it is valid, it prevents the use of them except by permission of the patentee, and the payment of such royalties as he may choose to exact, and, however fairly intended to prevent imposition, gives the appearance of a pecuniary speculation to an enterprise emanating from a public institution, whose discoveries in agriculture should be as free as air to all our citizens.

PROFESSOR STOCKBRIDGE'S THEORY AND CLAIMS.—The general statement of the value and effects of these fertilizers may be found in the advertisement of the person named by Prof. Stock-

bridge in the college report as his only authorized agent, as follows:

"*Stockbridge Fertilizers.* These fertilizers are made for different crops by formulas worked out by Prof. Stockbridge, of the Massachusetts Agricultural College, and have given extraordinary results, at small cost, producing, for example, from seventy-five to one hundred bushels of corn to the acre, corresponding results with other crops, *without any manure*, at a cost of about twenty-five dollars per acre, and without exhausting the soil, but leaving it richer by actual test. That the farmer may get *the right* ingredients, separately, or properly compounded, we are entrusted by Prof. Stockbridge as *the only* parties in the country to furnish them *under his name*. Pamphlets, containing the formulas, and other valuable information, sent free."

The general theory of Prof. Stockbridge has been, in most points, familiar learning for a generation past, at least. It is that growing plants are made up of certain elements which they obtain from the soil, from the air, or from water; that by chemical analysis it is ascertained what those constituent elements are, and in what proportion they exist in a given plant or crop; that the elements furnished by the soil are *nitrogen*, *potash*, *phosphoric acid*, with lime, soda, magnesia, silica, etc.

Prof. Stockbridge assumes that all the elements of plant food are supplied in abundance by the air and water, and the natural condition of ordinary soil, except three, *nitrogen*, *potash*, and *phosphoric acid*, and for the purposes of this discussion this assumption is not questioned. Then, he says, apply to the soil these three substances in the proportion in which they exist in the crop, and this is the true manure to produce such a crop. And this is not controverted, and is in theory correct.

Referring to his published formulas, we find them all to be in this form: "To produce fifty bushels of the grain and its natural proportion of stover to the acre more than the natural yield of the soil, use" so many pounds of nitrogen, so many pounds of potash, and so many pounds of phosphoric acid. To produce fifty bushels *more* than this natural yield, he applies just as much nitrogen, potash, and phosphoric acid as are found in fifty bushels of corn and its stover.

Prof. Stockbridge says in the college report, "Allusion has already been made to the curious form of the statement of the for-

mulas. It is similar to one which might be made by a mechanic, that to cover the side of a building thirty feet long and fifteen feet high, it will require four hundred and fifty square feet of boards. It would perhaps be preposterous to say, from our limited data, that the statement of the formulas in results can compare in exactness with that of the mechanic, but a few facts in the form of figures will show that in a few years it might approximate it very closely."

Instead of this illustration in mechanics, let us try the following: I have a cow that gives daily, on ordinary feed, eight quarts of milk, which may be called her natural yield. I wish to make her give sixteen quarts per day, eight quarts more than her natural yield, and to effect this I give her the constituent elements of eight quarts of milk, and to be exact in quantity, I give her to drink eight quarts of her own milk. Why should she not give sixteen quarts the next day?

Some of the reasons why we should not expect the application to the soil of the elements of fifty bushels of corn, to add fifty bushels of corn to the crop, readily occur to us all. We may estimate ten inches of soil upon an acre, as I have said, to weigh a thousand tons, or two million pounds. We apply to this, three hundred or four hundred pounds of a fertilizer. It is manifestly impossible so to incorporate this small amount with the soil, that the roots of the corn shall find just as much more of each element as we have added, and what the plant does not find is useless to it. Again, the condition of the soil as respects drainage and pulverization, and its density, are essential. In a soil filled with stagnant water nothing but water-grass, and mud turtles can thrive, however fertile it may seem to the chemist, and a hard, compact surface, like a roadway, however rich, can produce nothing.

We are told to apply nitrogen, potash, and phosphoric acid, but these are not articles of commerce, which a farmer is expected to buy under those names at a reasonable price. The pamphlet referred to in the advertisement tells us in what form we can obtain these elements, as follows:

"*Commercial Sources of Nitrogen, Potash, and Phosphoric Acid.* Nitrogen.—From sulphate ammonia, Peruvian guano, dried blood, common saltpetre, nitrate soda, fish guano. Potash.—From muriate potash, sulphate potash, wood ashes, common saltpetre, carbonate potash. Phosphoric Acid.—From dissolved

bones, dissolved bone black, dissolved burnt bone (bone ash), dissolved South Carolina rock, dissolved Canadian apatite."

Certainly it needed no professor to tell us that Peruvian guano, nitrate of soda, and wood ashes, are fertilizers, but it does need a skilful chemist to give us the equivalents in these articles for the constituents of the Stockbridge fertilizers. Prof. Stockbridge says Mr. Judd spoiled his potatoes by using muriate of potash instead of sulphate, and Mr. Fowler made a total failure because he applied the fertilizer in a liquid form to "a coarse sand with a gravel subsoil," so that the rains washed it away before it could afford the crop much nutriment. In a printed statement, it was said by Prof. Stockbridge himself, that he failed in an experiment by using a quantity of the Stassfurth salts, which by a subsequent analysis he found to be very poor in potash. These are only illustrations of the difficulty of conducting experiments of this kind, and of the small value of single instances, in arriving at general conclusions.

The Theory contains a Manifest Fallacy. — The difficulties suggested in the way of the practical working of the Stockbridge theories, are by no means the chief objection to them. The system rests upon a fallacy, which is fatal to it. It is a system of exhaustion and not of compensation, and a very slight examination will demonstrate the truth of this statement. To produce fifty bushels *more* of corn than the land will yield in its present condition, you should apply the quantity of nitrogen, potash, and phosphoric acid, that fifty bushels of corn contain. If the land would have produced fifty bushels without the fertilizer, it should now produce a hundred bushels. You have applied the elements of fifty bushels and removed a hundred bushels. Where did the crop find the elements of the fifty bushels which you did not supply? It is part of the theory of Prof. Stockbridge, that the three elements in question must come from the soil. Then you have exhausted the soil to the extent of fifty bushels. You have treated it precisely as if you had applied no fertilizer, and taken off a crop of fifty bushels.

It seems so nearly incredible that such a system as this should be gravely recommended to the public by our Agricultural College that it will be proper to examine it more in detail. For convenience, we will continue to use the formula for Indian corn. In the college report it is in these words: "To produce fifty bushels

of the grain and its natural proportion of stover to the acre more than the natural yield of the soil, and in like proportion for other quantities, use nitrogen sixty-four pounds, potash seventy-seven pounds, phosphoric acid thirty-one pounds." The form in which these elements may be found is stated, but is not material to this point. Prof. Stockbridge assumes that fifty bushels of corn, with its stover, contains the quantities of nitrogen, potash, and phosphoric acid above stated. To show that there is no mistake on this point, I refer to the "Agriculture of Massachusetts," 1875–6, Part Second, p. 79, where, in an essay by Dr. Sturtevant, he gives, as an average result, the quantities of nitrogen and phosphoric acid removed from the soil by a crop of fifty bushels of corn and stover, within a half pound of the amount assumed by Prof. Stockbridge, and the potash precisely the same. And he adds, "The conclusion therefore is irresistible that *if* this table represents the amount of these constituents removed from the soil by our crop, then this table represents the actual exhaustion of the soil by the removal of our crop."

Dr. Sturtevant gives the true theory of compensation, to supply what your crop removes. Prof. Stockbridge supplies fifty and removes a hundred, and claims that "the soil is left in better condition than it was before being cropped by this method." *

To illustrate: he has a measure of two gallons, which is half full of a liquid. He puts into it another gallon which fills it. He then pours out two gallons, and still has more than one gallon left in it. The only parallel to this result is the instance of the poor widow's cruse in the scriptures, and that supply was miraculous.

I give another statement from the college report: *

"A plot treated in the same way in 1874, produced one hundred and four bushels of corn per acre. The normal capacity of the land at that time, as proved by a crop on our unmanured plot, was thirty-four bushels per acre. This manured plot was planted again with corn in 1875, without manure, and its yield was sixty-four bushels per acre, or thirty bushels per acre as the second result of the manure applied in 1874."

The amount of fertilizer applied is not stated. According to the theory, he put on the fertilizer to produce seventy bushels

* Thirteenth Annual Report of the Massachusetts Agricultural College, page 41.

more than the land would produce without it, for that was the result. The next year he gained thirty bushels. The results are these: He applies the elements of seventy bushels, and removes one hundred and four, *plus* sixty-four, a total of one hundred and sixty-eight bushels, or ninety-eight bushels more than he compensated, and still the land improves in condition. If such a discovery has really been made, the claim which the president of the college makes in connection with it is very moderate "that the money expended upon the college will yield a larger rate of interest than any other investment which the State has ever made." *

All the formulas are given in what the professor calls this "curious form:" "to produce so much more than the natural yield of the land." If we could assume that each acre has a permanent natural yield, which it can forever maintain without manure, then we might apply fertilizers enough for the crop in excess of that natural yield, and not exhaust the soil. If your field will yield fifty bushels, without manure, you may forever supply fifty and remove a hundred, and not exhaust the soil, though it would still be difficult to see how it could improve. It is enough to say that we have no such soil, and nobody will contend that we have. In all the experiments given, the "natural yield," as it is termed, is found by observing what a portion of the field not manured that year produced. Prof. Stockbridge in the statement last quoted, says, the "capacity of the land *at that time*, etc., was thirty-four bushels."

The following extract from the circular issued by Prof. Stockbridge's only authorized agent shows that the common notion that we must put on to the land as much as we take off is not controverted:

"If fifty bushels of corn remove from the soil sixty-four pounds of nitrogen, seventy-seven pounds of actual potash, and thirty-one pounds of soluble phosphoric acid, we cannot raise many such crops without exhausting the soil, unless we are sure we put back in the form of manure, or fertilizers, as much as we take off in the crops." †

This, it will be observed, is utterly inconsistent with the formu-

* Thirteenth Annual Report of the Massachusetts Agricultural College, page 15.

† The Stockbridge Fertilizers and Formulas, p. 5.

las, which only require enough of the fertilizers to compensate for what we remove *more* than the natural yield.

WHAT IS NEW IN THIS SYSTEM. — Reference has already been made to the experiments of the two learned professors, at Munich, given by Liebig in his "Natural Laws of Husbandry." They used the same three elements, nitrogen, potash, and phosphoric acid, which Prof. Stockbridge uses. They cultivated their plants in pots filled with soil of the same kind, carefully prepared; and applied the elements in different proportions and quantities. I can only refer to the volume itself for the exceedingly interesting account and discussion of these experiments. I am not able to see that they do not include the whole ground covered by Prof. Stockbridge in his experiments, and they show that the three elements used by him as the essentials of plant food, were at that time familiarly known as such, and as the most essential.

In 1866 a translation was published in Boston, of a little book entitled "High Farming without Manure; six lectures on Agriculture, delivered at the experimental farm at Vincennes" (in France), by M. George Ville, Professor of Vegetable Physiology at the Museum of Natural History, Paris. In the college report of 1875, Prof. Stockbridge speaks of this author and his experiments, and says that it seemed proper to test the matter and ascertain whether it was necessary to supply the same elements in this country that were found to be necessary in France. So far as appears, he pursued the same system of experiments, with pots in a plant house, to ascertain what elements were necessary to add to the natural soils of that region to render them productive of given crops. His conclusions I have already given you, that only three elements,—nitrogen, potash, and phosphoric acid—need be supplied, nature furnishing the rest.

M. Ville, at the opening of his last lecture says: "All that I have stated to you previously may be summed up in the two following propositions:

1st. There exist four regulating agents *par excellence*, in the production of vegetables: nitrogenous matter, phosphate of lime, potassa, and lime.

2d. To preserve to the earth its fertility, we must supply it periodically with these four substances in quantities equal to those removed by the crops.

You will observe that M. Ville supplies precisely the same three

elements that Prof. Stockbridge uses, and also lime. By turning to his formula, I find that Ville uses one hundred and thirty-two pounds of quicklime to the acre, a quantity so small and cheap as to seem immaterial, and an amount more than supplied by the phosphates of lime in which the phosphoric acid of Prof. Stockbridge is found. I am unable to discern any difference in the two systems, or in their application to practice. Each undertakes to return to the soil the proportion of the three essential elements removed by the crop, and M. Ville adds, for France, a very small quantity of lime. If, however, Prof. Stockbridge really contends that he can, year after year, remove from the soil twice as much of these elements as he supplies, and constantly improve the soil, he certainly makes a claim which is original.

The fertilizer recommended by M. Ville was fairly tried by myself and others on corn and other coarse crops ten years ago. It proved successful in all respects, except that it was too expensive to be economical.

My conclusions as to the Stockbridge Fertilizers, at present are these:

That they contain nothing valuable in theory, that was not well known and fully illustrated by Liebig, Ville, and others, long ago.

That the formulas, as given, involve a fallacy, and if followed must either result in a failure of the crops or exhaustion of the soil.

That an application of enough of the elements named to actually produce a crop and maintain fertility, is too expensive for ordinary use.

Discussion.

Marshall P. Wilder supposed that the eyes of the gentlemen present would be turned to him as the representative of the Massachusetts Agricultural College, of which he was one of the founders. The paper which had been read was full of information, posting us up in regard to the history of the subject, and the writer had not only come in as evidence, but had undertaken to act as judicial authority. Mr. Wilder regretted that Prof. Stockbridge had taken out a patent for the manufacture of fertilizers according to his formulas, but the patent covers nothing except the right to *sell* these mixtures under the name of the Stockbridge fertilizers. The materials can be bought anywhere, and anybody

can mix them. Judge French has told us that plants are composed of certain elements from the soil, and has mentioned the experiments of Liebig, Ville, and others, and the doctrines drawn from these experiments are now well established. Mr. Wilder said that he was a man of progress, and he feared that the paper, if read superficially by the public, would lead them to believe that the whole matter of the application of special fertilizers is a humbug. The question is, whether these fertilizers are capable of doing what Prof. Stockbridge asserts they will do. Dr. Sturtevant, Dr. Burnett, and E. F. Bowditch, tested them last year, with favorable impressions, and though one swallow does not make a summer, yet if the fertilizers will effect only half as much as is claimed for them they will be worth more than all the agricultural colleges in the country have cost.

Dr. E. L. Sturtevant said that all must have observed how a stream that has been dammed rises gradually by retrogressions, the wavelet at the bank being now higher than the flood, and now lower, but the water continually deepening. So it is with the progress of human opinion; now a wave of public excitement rises into prominence at the apparent discovery of a truth, and then retrogresses as an error is discovered; yet new truths have been added to the old, and the general progress has been advanced. It is the advancing wave that fluctuates, but the larger water continually crowds towards the barriers. It is the advanced thinkers, and the leaders of progress, who vibrate upon the borders of the unknown, while the advance of the general public is steady. The new truths, so called, are so mingled with errors, the necessities of progress, that we must recognize in them the demands required by progress, and overlook the minor variations brought about through individual enthusiasm and one-sidedness.

He deemed Prof. Stockbridge and his formulas no exception to this general rule, and he expected to find in them both truth and error. The errors may be harmless to the wise public; the truths may be of vast importance. He did not desire to criticise the originality which he claimed, or the methods whereby he had brought his formulas before the public. His standing as an investigator and as a man of science, if such he has, should be discussed before another tribunal than this. What concerns us as farmers, is the value for manuring our fields, of the formulas to which he has given his name, and Dr. S. but mentioned his claims in order that an opinion may be expressed upon their use in farm practice.

Dr. Sturtevant stated that Prof. Stockbridge claims that by supplying to our fields the chemicals representing, in kind and amount, the materials removed by our crop, we can invariably produce the crop. That is to say, if we apply the potash, phosphoric acid, and nitrogen, which analysis shows fifty bushels of corn and its stover to contain, then we shall expect to obtain a crop of fifty bushels. He added that the mere mention of this claim brings into prominence the enthusiasm which is possessed by its originator; that his claims are supported by too few facts to receive universal credence; but still, in the present state of American knowledge, the verdict must be given "not proven," only. He said *American*, because the most of our experimental knowledge on the subject is from English sources, and Americans have been always too ready to use these for inferences, forgetting the differences in climate. Thus, in old England, the winters are mild, and the rainfall, which is large, passes down through the soil, and carries with it fertile elements. In New England, as a rule, the winters are severe, the ground is frozen deeply and the rain and snowfall passes off mostly by flowing over the surface of the land. English experiments justify the belief, for instance, that of the applied nitrogen, one-third is taken up by the crop, one-third passes away in the drainage, and one-third remains in the land in an inert form. With our different climatic conditions, does the same rule apply here? The Doctor said that we have no evidence for or against, and consequently cannot decide.

Dr. Sturtevant continued: Prof. Stockbridge further claims that his yield is intended to be above the natural yield of the soil, and defines the natural yield as being the product of an unmanured portion of the field. Here he has made an evident miscalculation. For instance, to a field which last year was excessively manured, I apply his formula on one half, and no manure on the other half. It is probable that there will be little difference between the two yields to represent the efficacy of the fertilizer. What then is the natural fertility?

Every agricultural field on any farm contains two kinds of fertility. The one is the surplus of the manure which has been applied in previous years, and which has not been removed either by crops or other agencies; the other is the natural fertility, or that amount of fertility which is food to the plant by natural agencies each year. We may measure this last fertility by a fallow yield.

The fallow yield of a piece of land is the practical measure of its fertility.

Let us apply this rule, continued the speaker, to our supposition. We apply to our highly manured field a further amount of fertilizer—say for twenty-five bushels of corn—and we obtain seventy-five bushels of crop. We claim, for this illustration, twenty-five bushels for the effect of the fertilizer applied this year, forty bushels for the effect of the manure which has been applied in past years, and of which sufficient still remains to produce this result, and ten bushels for the natural fertility of the land: for if we take a plot which is too barren to produce corn, and plough and grub and scarify for one year, the next year it will produce some corn, and the amount may be ten bushels.

Dr. Sturtevant said that he believed in the principle of the Stockbridge formulas, because it is a system; and a systematic procedure always has an advantage over a hap-hazard procedure, for it develops experience in its train. He thought it promised great present benefit to the farmer, and very much prospective benefit. Farm practice will soon remove it beyond its experimental stage, and as its defects are brought to light, the experience gained will stand ready as a corrective. He could not at present endorse this system, for it is still in its experimental stage, but he was willing to protect and cherish the chrysalis in the hopes and strong expectation of the imago which might result.

He concluded by saying that the matter is now beyond the oversight of the Professor, and that it became us all, before criticising too harshly, to give it an experimental trial, for it would take but a short time to test it by numbers, and to observe whether it would stand the test; that truth was mighty and would prevail, and that it was for the present generation to say whether progress should be present with them, for their benefit, or whether it should be embalmed for their successors. He urged not to despise the untried, nor to be too tightly bound by our prejudices, but to give the new a welcome according to its promise, and to test the promise by care-taking, cautious experiment.

Benjamin P. Ware said he had long been of the opinion that farmers could not use the commercial fertilizers offered in years past to advantage, and he had great hopes from the fertilizers recommended by Prof. Stockbridge. There was one important point omitted in Judge French's paper, and that is that nature has

the means, from her own resources, to make a fertile soil. When we get a fertile soil we find that it may be cropped for several years without manure, but when it is depleted, the question arises how to replace the deficient elements. A very large proportion of the substances necessary is obtained from the air, and farmers should attempt to assist the crops in obtaining these elements from the air. The difficulty presented in the discussion of the subject is the question, suggested by Prof. Stockbridge's formulas: How we can take away more than we put in, and still keep up or increase the fertility of the soil? The answer is, that by the application of fertilizers we aid nature in its work; and besides the substances obtained by plants from the air, the disintegration of rocks is constantly going on and adding to the fertility of the earth. It is not likely that any crop takes away all that we apply to it. He had great hopes for the farmers of Massachusetts, from the application of the principles enunciated by Prof. Stockbridge, for they have great need of such assistance as is promised by them. Mr. Ware wished again to enforce the principle that farmers should seek to aid their crops in obtaining nourishment from the air, and concluded with the remark that Nature, or God, helps that man most who most helps himself.

J. W. Talbot said that one of the greatest troubles with cultivators, in the use of fertilizers, was in not knowing what they wanted or what they applied. He liked Mr. Ware's remarks, and thought that we had overlooked the facts stated by him. We must keep up the fertility of the soil by manure, but if we can, by adding twenty-five dollars worth of manure, produce fifty bushels more of corn, we reduce the cost of our corn per bushel. He had been amused by the illustration drawn from the cow by the essayist, but the cases are not parallel. If the cow is giving all that she is capable of giving, the course suggested would be ridiculous, and if the land is producing to its utmost capacity it would be useless to add fertilizers, but the object of fertilizers is to bring it up to its full capacity.

Charles M. Hovey said that it would be impossible to discuss the subject fully in an hour. The subject has come up now because there is something apparently new in the formulas promulgated by Prof. Stockbridge. There is nothing new about them, and there ought not to be any patent on the mixtures, to prevent our cultivators from using them freely and giving them full trial.

There was some reason for giving Morse and Howe patents for inventions which they had labored during a whole lifetime to perfect, but to come forward and patent these old ideas was ridiculous, and beneath the dignity of an institution endowed by the State for promoting agriculture, and in which the patentee was a professor. Why might we not apply the elements to produce a hundred and fifty bushels; or even two hundred, as had been grown in South Carolina; or two hundred and sixty-three, as in Ohio? He did not know that there was any limit to the amount that could be produced, if you once admit it can be increased exactly fifty bushels. He agreed with the gentleman who had spoken of the large proportion of plant food derived from the air. We cut down a wood and burn it and get a large quantity of charcoal; does this all come from the fertilizer? A rich soil, if not ploughed more than three inches deep, will not produce a good crop. Jethro Tull believed that by thoroughly and constantly stirring the soil, crops might be produced continually, without the application of manure. The statement made by Dr. Sturtevant in regard to the different effects of an English and a New England winter on the soil, explained the general superiority of English lawns over our own.

Mr. Wilder thanked Mr. Hovey for what he had said. In the remarks which he had himself previously made, he wished to disabuse the public mind of the idea that the Agricultural College had any connection with these fertilizers.

Robert Manning thought that while the fact remained that these formulas were put forth by a professor in the Agricultural College, and were the result of studies in the service of the college, the public mind would not be reconciled to the idea of a patent for them.

Leander Wetherell asked if the Agricultural College did not indorse the Stockbridge fertilizers.

Mr. French replied by reading the following passage concerning them, from the "Thirteenth Annual Report of the Massachusetts Agricultural College," page 15: "If one-half of the apparent results shall be substantiated by the future experience of the farmers of the country, then the money expended upon the College will yield a larger rate of interest than any other investment which the State has ever made."

Mr. Wetherell deemed it fair to presume that the crop would take up all the fertilizers put on to produce the additional fifty

bushels, as specified in the formula. The question of the soil taking plant food from the air is an old one. If the plant depend mainly on the atmosphere for nutrition, then, he asked, what is the necessity of fertilizing the soil? and called on Dr. Sturtevant to answer this question. And why is it that a gravelly New England soil will not produce as good a crop as the Scioto Valley? An atmosphere of the same quality hangs over both. Does not Prof. Stockbridge represent that it will not pay to hire a man to cart barnyard manure? *

One farmer had spoken of Peruvian guano as supplanting barnyard manure. A Scotchman once said he had found out a new fertilizer of which he could carry enough for an acre in his vest pocket. Mr. Wetherell said that he would buy stable manure, and take good care in purchasing fertilizers. He spoke of a farmer in Westfield who got just enough more corn by applying guano, to pay for the guano. All such attempts as that under discussion, have only served to mislead farmers and cheat them out of their money. He did not believe that we can say "so much nitrogen, potash, and phosphoric acid, and so much corn." He intended, nevertheless, to try the prescription for a crop of grass.

William H. Bowker said that the patent on Prof. Stockbridge's formulas, about which so much has been said, was in effect a copyright, and should not be so severely criticised. The formulas of Prof. Stockbridge have been printed and spread broadcast, and the farmers can go where they choose to buy the materials used in compounding. Prof. Stockbridge had for his object in obtaining this patent the protection of his own name, and at the same time the protection of the farmers against gross frauds, and he should be praised rather than blamed for this course. Without the patent or copyright, scores of parties all over the country would have set up to compound these formulas, but what guarantee would Prof. Stockbridge or the public have had that they were honestly or properly prepared?

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* See his "Experiments in Feeding Plants" in the Thirteenth Annual Report of the Massachusetts Agricultural College, and in the Twenty-third Annual Report of the Secretary of the Massachusetts Board of Agriculture.

BUSINESS MEETING.

SATURDAY, April 1, 1876.

A duly notified stated meeting was holden at 11 o'clock, President Parkman in the chair.

On motion of W. C. Strong, Chairman of the Committee on Publication and Discussion, it was

Voted, That a Committee of five be appointed to take into consideration the recommendations concerning the Society's Herbarium, in the paper read by the Professor of Botany, at the Meeting for Discussion on the 18th of March.

The Chair appointed W. C. Strong, C. M. Hovey, E. S. Rand, Jr., E. H. Hitchings, and Waldo O. Ross. The Professor of Botany, John Robinson, was, on motion, added to the Committee.

On the recommendation of the Executive Committee, it was

Voted, That the Treasurer be, and he is hereby directed to send a certificate of Life Membership to George E. Davenport, as a slight mark of the Society's appreciation of the extensive and valuable collection of Ferns presented by him to the Society, and that the usual fee be remitted.

The Executive Committee also recommended the appropriation of a sum not exceeding one thousand dollars to defray the expense of collecting and forwarding fruit and other horticultural products to the Centennial Exhibition at Philadelphia. The appropriation was unanimously voted.

On motion of Marshall P. Wilder it was

Voted, That the thanks of the Society be presented to Edward Sprague Rand, Jr., for his valuable and faithful services as Recording Secretary of the Society for many years, and that a committee of three be appointed to report what testimonial shall be made in recognition of these services.

The Chair appointed Marshall P. Wilder, W. C. Strong, and B. G. Smith.

A donation of seeds from the United States Agricultural Department was placed in the hands of the Vegetable Committee for distribution.

The Library Committee were authorized to dispose of certain water-color paintings of flowers.

The following preamble and resolutions were offered by Charles M. Hovey:

The Massachusetts Horticultural Society having learned, with deep sorrow, of the death of Josiah Stickney, one of the Ex-Presidents of the Society,

Resolved, That in his decease the Society has not only lost one of its oldest and most honored members, but one who has aided and counselled by his good judgment, and promoted its objects by his many and frequent contributions of flowers and fruits.

Resolved, That we recall, at this time, the generous gift which he bestowed upon the Society for the special purpose of increasing our fund of valuable knowledge in all departments of horticulture, and acknowledge with deep gratitude the rich and timely aid bestowed on a science which it was the pleasure of his life to promote, and we rejoice that a kind Providence permitted him to see the good results of his gift.

Resolved, That we desire to place on record our recognition of the many and valuable services he has rendered, during a period of nearly forty years; our high esteem for the fidelity with which he fulfilled the duties of every office, and our admiration of his sterling qualities as a man and a citizen.

Resolved, That we sympathize with his family in their great bereavement, and offer our condolence.

Resolved, That these resolutions be entered on the records, and a copy be sent to the family of the deceased.

Mr. Hovey spoke of Mr. Stickney as one who, until within a few years, had been constantly with us, and equally constant in his contributions to our exhibitions. His love for horticulture grew out of a visit to one of the dahlia exhibitions of the Society, then the most popular autumnal flower. He became a very successful cultivator, attending the meetings at which arrangements were made for the grand dahlia exhibitions of that day, taking part in the discussions of the properties of form, color, habit, etc., which go to make up a perfect flower, and in establishing rules for the exhibitions. At that time he had only a small garden at his residence on Tremont street, but his increasing interest in horticulture soon led to the purchase of the beautiful villa in Watertown,

formerly the Hunt estate, which was afterwards his home. Mr. Hovey said that the circle to which Mr. Stickney belonged was narrowing, and he wished to place on record his admiration for so good a man.

Marshall P. Wilder said that he had been cognizant of Mr. Stickney's life for many years, and that he was not only an enthusiastic cultivator of the dahlia, but afterwards became equally interested in the culture of fruit, especially the pear. In this department he was a most careful observer, and a practical cultivator, continuing to ascend his trees after his friends thought it imprudent, on account of his age. He had frequent consultations with Mr. Wilder as to how he could best render material aid to the objects of the Society, which resulted in putting into his will a clause devising his beautiful estate in Watertown to the Society, for an Experimental Garden, an object deemed of the first importance by the founders of the Society. This provision stood for fifteen or twenty years, when Mr. Stickney became convinced that it would be wiser to bestow the contemplated gift in aid of the Library, and accordingly, in 1869, he established the "Stickney Fund." At the time of his death he had attained a greater age than any other member of the Society, except Dr. Jacob Bigelow and Cheever Newhall.

The resolutions were unanimously adopted.

On recommendation of the Executive Committee,

ROBERT M. BARNARD, of Everett,

was elected a Life Member, and the following named persons were elected as Corresponding Members:

DR. JOSEPH D. HOOKER, Director of the Royal Botanic Garden, Kew, England.

JAMES MCNAB, Curator of the Botanic Garden, Edinburgh.

J. LINDEN, Ghent, Belgium.

ÉDOUARD MORREN, Liége, Belgium.

Adjourned to Saturday, May 6.

MEETING FOR DISCUSSION.

W. H. Halliday read the following paper in continuation of that presented by him January 29th:

Wardian Cases and Ferneries. II.

BY W. H. HALLIDAY.

Plant cases, as we know them, are classed under two heads. First, the Wardian case, in which are grown foliage plants, ferns, etc.; plants too large or too coarse to look well in a small case. Although the first Ward's case was only a bottle, in which by accident Mr. Ward discovered that plant life could be sustained, from some cause or other we seem to have adopted the name Fernery for cases that are covered with a glass shade, in which only the more delicate or smaller varieties of ferns are cultivated. The schedule of this Society limits the size of the fern-case to fifteen inches in diameter.

In drawing a line between the Wardian case and fernery, the Flower Committee ruled out a case put up for competition, that was filled mostly with foliage plants, deciding that such plants were not admissible to a fernery, except when they were of such size and character as would not interfere with the general beauty and harmony of the whole, and then only in a small proportion to the number of plants used.

In this article I will endeavor to give some experience I have had with cases varying in size from four to fifteen inches in diameter.

The case may be made of tin, earthenware, or wood; it matters not which, so long as proper regard is had to drainage. This, as in Wardian cases, is of vital importance to the healthful growth of plants under the fern shade. I say this is of the *first importance*, as many persons who have the management of ferneries, use so little judgment in their care, that, without a proper outlet for water, the cases soon become perfectly sodden. I have seen more plants destroyed in cases, from the want of drainage and from over-watering, than from any other cause. Most of the failures I have met with have arisen from either too much water or too little light,

and frequently both combined; although the persons having them in charge have strenuously denied that any more water had been used than the plants required, and have insisted that they were placed in a very light situation. The light situation is usually quite a dark one; generally a space between two windows, with a dead wall back of it, or in a corner receiving a little light obliquely from a window two or three feet distant. When the plants are turned out, it is found that they have been treated as aquatics, and kept fairly up to their knees in mud and water. Then people wonder at their want of success.

THE HANGING FERNERY was my first attempt in this direction. I designed it to take the place of the hanging basket, which so seldom appears in good condition in the home. The case was turned from walnut, several pieces being glued and nailed together to get the proper depth, and also to keep the wood from warping. It tapered to a point at the bottom, to give lightness to its appearance. A zinc pan, with a rim to receive the shade, fitted the case loosely enough to be readily removed when watering was necessary. This case, as first constructed, was covered with a shade eight inches in diameter and ten inches high, and was suspended by silvered copper wire. The case first exhibited in this hall in June, 1871, had a shade twelve inches in diameter and fourteen inches high; was elaborately turned from maple and walnut, ornamented with ebony trimmings, and filled with the following named plants:—*Onychium Japonicum*, *Adiantum assimile*, *A. cuneatum*, *Selaginella Wildenovii*, *Panicum variegatum*, *Fittonia Pearcei*, *F. argyroneura*, *Lycopodium denticulatum var.*, and *Mitchella repens*, some lichens and wood mosses. It was awarded the Society's Silver Medal.

This case, when taken from the hall, was suspended in my window, where it received the morning sun for about an hour each day, and was not disturbed again till January, excepting when it was occasionally turned to the light. It was then a mass of green. I noticed considerable soil on the glass, carried up by slugs in their nocturnal rambles; also some decayed fronds of the *Adiantum*. Altogether it was as much of a success as a close case could be, and would probably satisfy most people who grow plants for home decoration.

There are some plants that seem better suited to a close case than to any other situation. They are confined chiefly to the Lycopods and Selaginellas. Many of them are very beautiful, rivalling,

and in some cases closely resembling, their allies, the ferns, in beauty of form and delicate, feathery appearance. They make superb specimens, grown singly under a shade; and I consider this the most satisfactory way to grow them, having the case large enough to fully develop their beauty of form and habit. Their growth is generally quite rapid, and to any one who delights in a well grown plant, the culture is worth trial. *Selaginella Lyallii*, *S. Africana*, *S. plumosa*, *S. umbrosa*, and *S. triangularis*, make quite large plants and are erect in habit. There are many others usually found in plant catalogues, and as far as I have tested them all are eminently fitted for close cases, and their growth is much more rapid than when grown outside. I usually combine them with ferns in the arrangement of a case, and think the effect is much better for the combination.

The *Fittonias* are another class of plants which are favorites with me. Their bright crimson and silver veinings are a great acquisition to the fernery, lighting it up wonderfully, and seemingly never out of place, no matter what the size of the case may be. They also make superb plants by themselves. I once had a plant of *F. gigantea* which filled a shade twelve inches in diameter and fourteen inches high. It was the finest plant of the kind I ever met with. Its habit became erect, and the color of the foliage seemed very much more brilliant than we ordinarily find it. But the varicty is too coarse to be grown satisfactorily with small ferns. The Wardian case is the more suitable place for it. *F. Pearcei* is the best for all purposes; being a vigorous grower, a mere scrap soon produces a good plant, and it will live under almost any treatment in a close case. Its habit is not so recumbent as when grown without. *F. argyroneura* is very beautiful, but it has one fault,—that of damping off when it is chilled, thus spoiling it for winter use, unless in a very warm situation, but it is just the plant for summer use. There are so few plants of a white or silvery appearance suitable for this purpose, that I use the *Fittonia argyroneura* as long as the foliage will hang together, and then replace it with something else.

A few weeks since, I had the good fortune to be shown a plant of *Todea superba*, growing in a Wardian case. The case was about two feet square, and as many feet high, with a flat top. A pan about eight inches in diameter, filled with this truly superb plant, in vigorous growth, occupied the centre. Other filmy ferns were

planted out in the case, but this, the grand object of the whole, was elevated several inches above the others, showing conspicuously its full beauty. An English author says of it, "Delicate and fragile, with its semi-transparent fronds, it looks like tufts of the most beautiful sea-weed, plucked from the decorations of a mermaid's ocean home." I have seen larger plants of this species, but none in such fine condition. It was grown in a cool room, near a west window, the light partly obscured by a drawn shade. This plant is just the thing for a large fern shade, as it needs as little air as the *Selaginellas*, very little light, and a cool situation, and when once established needs but little attention. The filmy ferns are eminently fitted for growing singly in cases by themselves. The only objection is the expense of many of them, but I would rather have one plant of *Todea superba* than dozens of ordinary ferns.

The great difficulty I have always found in ferneries, is to reach the plants after they have filled, or partly filled the case. It is easy enough to remove the shade; but to replace it, so that the plants may retain their former position, is not so easy. This is so with regard to delicate ferns; the fronds will tip about, look out of place, and otherwise mar the arrangement. If you could only reach them from the top, all would be remedied very quickly. Frequently I have been forced to allow a large slug to have his own way, rather than disturb the shade when the case was looking finely; and in many instances, have allowed decayed fronds to remain, rather than run the risk of destroying the arrangement by removing the shade. It was almost as much on this account as for ventilation, that I constructed the dome top or ventilated fern case, which is as easily managed as an ordinary Wardian case. Lifting the dome does not disarrange the plants, as they are all confined within the cylinder, which need never be disturbed for this purpose. This case is constructed as follows:

The case or stand is of wood, six inches deep, and resting upon three small feet. There is a large opening underneath, covered with a movable slide to admit or exclude the air. It has a zinc pan one-half an inch less all round than the wooden case. This half-inch space is covered all around at the top of the pan, which leaves a flat surface of zinc, one inch wide, with an outside rim to receive the glass cylinder. This flat surface of zinc is pierced

with half-inch holes in its entire circumference about three inches apart. When the glass cylinder is in place, the half-inch holes are inside the case. The cylinder, of annealed glass, fits neatly into the zinc rim, and is fifteen inches in diameter by fourteen inches in height. Encircling the upper edge of the cylinder is a copper rim, one inch wide, with edge turned downward on the outside, a quarter of an inch wide, to fit on to the cylinder. The flat surface of the rim is perforated with quarter-inch holes, and the inner edge turns up a quarter of an inch, to receive the dome or cover, which is eight inches high and twelve and a half inches in diameter. The holes in this copper rim are on the outside, so that when the valve in the bottom of the case is open, the air passes up through the holes round the zinc pan, and out at the copper rim. The whole case when complete stands twenty-nine inches high from the table.

This case was first exhibited in 1873, and was filled at that time with *Onychium Japonicum*, *Adiantum cuneatum*, *A. assimile*, *Panicum variegatum*, *Selaginella Wildenovii*, *S. stolonifera*, *S. Martensii*, *Fittonia Pearcei*, *F. argyroneura*, and *Lycopodium denticulatum var.* A perforated cocoanut shell, filled with *Adiantum assimile*, was suspended from the top, giving completeness to the whole. This case is quite an expensive one, and can never become popular on that account; but for convenience in the management and culture of plants it has no rival. It received the Society's Silver Medal at the time of the first exhibition.

Generally, too many and too large plants are crowded into the fernery, giving it a heavy and unsightly appearance, and filling the shade completely at the outset, without room for further growth. *Dracœnas* and other plants of this kind make a fine display in the Wardian case, but are certainly out of place under a glass shade. I know it is very difficult even for those too who are not wanting in taste in other matters to understand this.

There are very few foliage plants that can be introduced into the fernery. I would recommend only plants of dwarf habit, such as *Reineckea carnea var.*, with grassy foliage, green and white; *Panicum variegatum*, a very pretty grass, with pink, white, and green foliage; and a small variety of *Bambusa Cyperus alternifolius var.* is quite pretty when a small plant, but the growth is almost too rapid for a fern case of ordinary size. The foliage is light and graceful and contrasts prettily with ferns. It is a charming plant for the Wardian case.

Rockwork in a case of the size just described, has a very pretty effect when well arranged. This is a difficult matter to accomplish and I generally prefer the case filled with plants rather than rocks, though for variety I occasionally introduce them. I use coke and pumice stone soaked in water, and sprinkled with cement to give color. These substances are very light and answer the purpose well. Quite small plants only are fit to be used with the rocks.

I have had this ventilated case filled with the following named plants, and the effect was highly satisfactory: *Nephrolepis exaltata*, *Adiantum colpodes*, *Onychium Japonicum*, *Selaginella umbrosa*, *S. Wildenovii*, *Panicum variegatum*, *Lycopodium denticulatum var.*; near the glass *Fittonia Pearcei*, *F. argyroneura* and *Peperomia maculosa*, and suspended in the shell a plant of *Selaginella cæsium*. This last is the prettiest basket plant I have ever used for summer decoration.

Among our native plants are many charming ferns that will soon accustom themselves to the confinement of the case. *Asplenium ebeneum* and *A. trichomanes* are very pretty ferns for rockwork; *Adiantum pedatum* is a lovely fern for a case, but requires rest in winter. *Polypodium vulgare* is pretty by contrast with those more delicate. There are several *Selaginellas* which will soon become quite at home in the fern case, and will be valuable acquisitions. *Equisetums* are pretty, and so different in their character and foliage from other plants, that one would hardly wish to be without them. Almost anywhere in the woods and swamps, beautiful and delicate plants may be found that will grace any fernery. Many gems are often discovered in this way. A favorite of mine is the *Mitchella repens*, or partridge berry vine, which takes readily to the close case, its bright red berries remaining perfect in their beauty for a long time. This plant always produces a wonderful effect, and there is nothing prettier for any case, no matter with what else it may be filled.

MANAGEMENT. — In the selection of a fern case I should choose one with an outlet for drainage. This I have already said is very essential, especially for a novice. If there is no drainage, water must be used *very sparingly*. Crocks and small pieces of charcoal, covered lightly with old moss to keep the soil from sifting down through, are the best for drainage. I prefer a case constructed of wood. For a case that will require a shade twelve or

fifteen inches in diameter, take three pieces of plank—walnut or other hard wood—two inches thick; fasten them securely together with glue and screws, forming a solid piece of wood six inches thick. The inside of this piece of solid wood is to be removed by the saw, leaving only a rim to support the zinc pan which is to contain the soil. This wooden rim, which is to be turned in finishing, can be ornamented if you wish. The case when complete will last for years. The heat and dampness will not affect it, provided no water is thrown over it. A zinc pan, with an opening in the bottom for drainage, fits into the wooden case. The pan is made with a rim to receive the shade; this will prevent water from coming in contact with the wood. This wooden case will cost about double the price of one made of earthen or lava ware; but it presents a better appearance in the room, and there is no trouble from scaling off or cracking, as is often the case with earthen ware. Very few of the latter are properly constructed for drainage; therefore I would recommend a wooden case. The larger the case, the more satisfactory it will be. Frequently in selecting a case one has to be guided by the space he can afford for it; but I should say the larger the case the better. I have had cases no larger than four inches in diameter, but of course they were mere toys, though better than none, if you have space for one no larger.

If you have a wooden case designed for a shade fifteen inches in diameter, make it six inches deep. This will give you two inches of drainage, and four inches of soil, in which can be grown any plants suitable for a case of this size. Most of the earthen fern cases are not more than four inches deep: this depth will answer for those of small size, but it is not sufficient for larger ones. The soil and method of planting recommended for Wardian cases are suitable for ferneries: also the same general treatment will answer for a ventilated fern case.

A fern case for winter decoration ought to be filled in August, or not later than the first of September. This will give the plants time to get fairly established, and make new growth for the winter, before the short, cold days commence. Cases filled later in the autumn afford very little satisfaction or pleasure, as they rarely get underway, or begin to make new growth, until spring, if they do not wholly die out during the winter. Were I intending to fill a case for my own use I should certainly plant early.

For the close case, I should only use such plants as are suitable.

Disturb the shade only when water is required, or signs of mould are visible, or the plants damp off; then give air for a short time each day, wiping out the glass when it is removed; this will generally remedy the trouble when practised a few times. When the plants are in vigorous growth, and during the warm weather, give considerable water, but withhold it almost entirely during the winter, and give plenty of light at all times.

Discussion.

No discussion of Mr. Halliday's paper was held, but the subject of the last meeting—chemical fertilizers—was again taken up.

John B. Moore said that the subject was a most important one to farmers and market gardeners, and he thought Mr. French's paper on the whole a very good one. Our main reliance must always be on barnyard and stable manure; the chemists will tell us that that is the most perfect manure, and this will generally be accepted. But, except in the neighborhood of large cities, no market gardener who depends on this alone can raise his crops, and consequently it must be supplemented with fertilizers, or we cannot have the highest farming. All of us have used the so-called superphosphates in years past, and all of us have been humbugged with them. Their failure was due to two causes—improper manufacture and fraud. They are better now, for the law compels every manufacturer to mark on his packages the quantity of each of the ingredients, and this enables any man of common sense to tell about what he ought to pay for the contents.

Professor Stockbridge's idea is almost the same as that of M. Ville—if there is anything new it is the exact specification of quantities. Prof. Stockbridge claims to raise a certain quantity of corn and stover more than the natural product of the land, and he assumes that the fertilizers which he applies to produce this result will, almost to a certainty, be all taken up by the crop, but Mr. Moore believed that, however carefully they were incorporated with the soil, some of them would not be used by the plants. Prof. Stockbridge claims also that the soil is left in better condition after applying the fertilizers and taking off the crop, but this would seem absurd, unless the powerful salts used have liberated fertilizing substances already contained in the soil. Mr. Moore said that he had himself doubled a crop of rye by applying guano,

and it would seem that the land should have been growing better, but it did not. Prof. Stockbridge would say that he had not put in the proper substances, but if we take away seventy bushels after applying only the necessary food for fifty bushels, it would seem strange that the soil should continue to grow better.

One of the worst things about these fertilizers was the patent, and it could not be denied that the Agricultural College had indirectly endorsed it. The speaker had the success of the college much at heart, but it is not what it should be, and some of the greatest injuries it has received have been at the hands of its friends. Prof. Stockbridge, while in the service of the Agricultural College, has made experiments, for the results of which he takes out a patent.

H. Weld Fuller said that he knew very little about the Stockbridge fertilizers, but he was a friend to fertilizers properly used; yet it appeared to him that there is a fallacy in these formulas. They assume that all soils are alike, and are to be dosed alike for the same result. They presume too, that the product will be just in proportion to the fertilizers added. Now we know that soils are not all alike; that each soil has its own power of absorbing, elaborating, and assimilating its food, and that the product is not always in proportion to the fertilizer. The plant therefore should be supplied with the food which it needs for its special service. Its growth is restricted to the *minimum* of any one of its constituents. Any excess of other materials will not add to the product, but may often do harm. We have long known what are the elements of our different crops. Corn, cotton, potatoes, and tobacco have been analysed a thousand times, and Liebig, Johnston, and several others have told us what there is in oats, peas, beans, and barley; but who has told us just what our own particular soil contains, and its power of absorbing and appropriating what we supply? There, probably, is never any lack of nitrogen, for the air and earth are full of it; nor is carbon lacking—air, rain and dew, and the processes of nature keep up an inexhaustible amount. Some soils, however, cannot make it energetic, and even an inferior material may increase the action in the soil; yet here we have a set formula to apply to every soil. By it you may add what you have already in abundance or excess. If I owe a hundred dollars and know that I have fifty dollars, it is a fair deduction that fifty are wanted. But if I have a hundred dollars to pay, and know noth-

ing of my resources, the Professor says "provide the whole." This process seems to be about what Prof. Stockbridge has patented. He does not tell us how much we have on hand or what we are to expect from the operations of nature. The only thing new in this patent seems to be its absurdity. Mr. Fuller said he should be sorry to feel that President Clark had fully endorsed these formulas, for he considered him one of the foremost men of the State in agricultural pursuits, and his experiments on the flow of sap and the power of plant-growth had given him a just fame, and greatly elevated his college. He feared that, whatever may have been the motive of Prof. Stockbridge in patenting these formulas, they would not increase the popularity of that institution.

The constituents of plants are organic and inorganic; all that will not consume are inorganic, and it is only these that we undertake to supply. Some soils have a great excess of some constituent. In Hungary, it is said, there are soils from which alternate crops of cotton and tobacco have been taken for centuries, without exhausting them. Prof. Stockbridge's formulas for these crops contain the same ingredients as for others, with the addition of lime and magnesia. The growth depends not so much upon what goes into the soil and what is taken out, as upon the substances which enable the plants to appropriate what is nutritive in the soil. These substances must have a certain form and condition and relation to each other, to become available. The inorganic constituents of plants are but from one to fourteen per cent. of the whole—commonly about five per cent.—and the air furnishes all the carbon and all the residue. Moisture, warmth, and air—heat and sunlight and chemical adaptations—are the conditions for development. The physical condition of the soil—its pulverization and exposure of parts—produce chemical changes, and are often very essential to production. True art in agriculture appears to consist in adopting proper means to make the most of what the soil contains, and in enabling the elements of the soil to coöperate in assimilating the food. Soils equally productive differ greatly in their chemical composition. By an excess of any element you may harm the plant. If, for example, there is too much of a soluble salt in the soil, after a rain the plant will absorb so much that, in case of hot weather following it, the evaporation from the leaves will be more rapid than the assimilation, and a white crust or powder is left on the surface and the plant sickens in consequence.

You may sometimes benefit the soil by reducing its chemical elements, as when you mix carefully sand with clay; and clay, merely by calcination and separation, becomes energetic and productive.

In cultivated grounds, if we know what crops have been last removed and what manures have been added, we can generally tell what to apply. We must study well the natural characteristics of the soil, and learn its composition, and find its wants. He did not make these remarks in opposition to chemical fertilizers, for he believed in them; they will, if appropriately used, provide what we need and cannot otherwise obtain.

William H. Bowker said that he wrote to Prof. Stockbridge to enquire about the patent, and read the following extract from his reply:

"AMHERST, March 31, 1876.

W. H. BOWKER:

Dear Sir,— * * * Until within the last four months the thought of getting a patent never occurred to me. My only thought was that if these things were absolute facts it would, in the matter of artificial fertilizers, make the practical farmer independent of the manufacturer and commercial dealer. He would be able to purchase the substances and compound them by the formulas which I had published, or given freely to every one who asked for them. It was only when it was fully developed that farmers generally would not pursue that course, but wanted the formulas compounded ready for use, and that a score of individuals in different sections were intending this year to engage in the manufacture and sale of fertilizers by the Stockbridge formulas, that I felt it my duty (as it was undoubtedly my right) to interfere, and by a patent retain control of the matter for my own credit and the interest of the great mass of farmers.

Now what is the patent? An examiner in the Patent Office prepared it for me, and in the manuscript he wrote 'manufacture, sale, and *use*.' On reading it over I told him I did not wish to patent the *use*—that should be left free. He took his pen and struck out the word *use*. The document went through the necessary stages in the office, and the patent was granted. When, however, I received the 'Letters Patent' I found it was headed in the set printed form of the office and the word *use* was in it, and though I did not want it, my patent is for the '*manufacture, sale, and use*.' But I declare that the use of these formulas is and shall be as free to the

farmers of Massachusetts as the springs of their hills, and they may go where they choose to buy their materials, and do their own compounding. And with equal earnestness I declare, if there is any force in law, no man shall have the privilege of manufacturing these fertilizers unless he is under my control, to the end that no such fraud and scoundrelism shall be practised on farmers in this, as have been practised in the case of some fertilizers.

LEVI STOCKBRIDGE."

Mr. Bowker added that he did not assume to defend Prof. Stockbridge or his formulas. That the Professor was fully able to do. He thought Mr. Moore's remarks very fair and candid, and fully agreed with him that barnyard manure is the best of all fertilizers, in that it seemed to be adapted to all plants, and also had a wonderful mechanical and chemical effect upon the soil. But the supply is not equal to the demand, and the question is, how shall we supplement it? It is impossible to know just what we have in our soils, but Prof. Stockbridge assumes that they are barren, and applies what each crop requires, thus really feeding it as you feed your animals. Is it not better, knowing what plants require, to apply those substances, than to keep on in the hap-hazard course which we have heretofore pursued, applying this thing and that, regardless of their wants? The formulas do not pretend to be infallible, and with further experience will probably be modified. With reference to Peruvian guano—that contains an excess of nitrogen and phosphoric acid, but only a small percentage of potash. Is it not better, therefore, to apply a fertilizer containing all the elements needed by plants, than a fertilizer deficient in either? The reason farmers have thought that fertilizers exhausted their soils, is that they were deficient in one or more of the elements of plant food, while containing an excess of others.

Marshall P. Wilder said that our motive in discussing this subject should be to treat it fairly, and he was very glad to hear Mr. Bowker say that Capt. Moore had done so. He was at first displeased with the idea of patenting these fertilizers, believing that the public were entitled to all the information that could be acquired by the College, but on reflection he found that Prof. Stockbridge's patent only precluded the selling of these fertilizers under his name and as prepared by him, and that no one would be prevented from buying the ingredients and mixing them for his own use.

The question for us to solve is, how much each plant needs, and how much we shall apply, and he hoped that every gentleman present would apply these fertilizers which have been recommended by Dr. Sturtevant, Dr. Burnett, and Mr. Bowditch, and report the results. He believed Mr. Moore to be one of the firmest friends of the Agricultural College. Notwithstanding its imperfections there is not another institution of the kind on the continent that will compare with it. If it has been drawn into the support of these fertilizers it is very unfortunate.

Mr. Moore expressed the opinion that chemical analyses of soils are extremely deceptive. With his powerful agents the chemist will find potash in a soil when plants cannot possibly find it. If a farmer has an analysis made of a sample of his soil he cannot be sure that it is an average specimen, and if he takes a little here and a little there how is he to make a prescription to suit the different portions of his ground?

Leander Wetherell, alluding to the experiment in applying guano to rye, mentioned by Mr. Moore in his previous remarks, asked why, if the guano contained all the elements of the rye, it did not continue to grow rye year after year?

Mr. Moore believed that there was something in the growth and vital action of plants beyond the reach of any analysis that the chemist had yet made.

Josiah W. Talbot remarked that all chemists acknowledge that rye needs potash, and that probably the failure of Mr. Moore's rye was owing to the fact that the guano supplied none. Prof. Stockbridge puts in all the elements needed.

Mr. Moore asked how it would be supposing there was plenty of potash in the soil.

Mr. Talbot replied that if there was plenty of potash, in a state to be taken up by the roots of the plants, there would be no need of adding it, but if he could get a crop of rye by applying potash in addition to other elements, he would be the gainer. In regard to the patent, it is only intended to prevent dishonest persons from mixing up a lot of spurious substances and selling them as the Stockbridge fertilizers; that is all there is about it, The formulas furnish what the people want, and though they may not be new they are not the less valuable. Prof. Stockbridge says that here are formulas which will produce certain definite effects, and in ninety-six cases out of a hundred where they have been tried they

have proved successful. He deemed their beneficial effects much less dependent upon the character of the season than some of the previous speakers thought. In an unfavorable season they would give the plant a start which would be a great assistance in overcoming injurious influences. He thought that the use of these fertilizers would add twenty-five per cent. to the value of our poor lands.

Mr. Fuller asked whether any one ever heard of a general prescription for sick men, without regard to their condition or needs. He did not think it practicable for every farmer to employ a chemist to analyze his soil; even analysis would be defective and only approximate the truth, because the nutritive substances in the soil, to be available and effective, must have certain relative forms and conditions, still unknown. But every farmer knows at least, whether his soil is full of lime, or sand, or peat, or clay, and whether it is wet or dry, and its common aspect. He can then determine how to treat it. But is it not a fallacy to assume, as Prof. Stockbridge does, that all soils are barren? If all we need for a clay field is tillage, sand, and air, why should we buy and put into it all the elements he prescribes? Chemical analysis shows that pipe clay has all the elements of a fertile soil, and yet it is one of the most barren, because it is too compact and has not the capacity to take from the air the oxygen and carbonic acid needed by plants, and to allow fine roots to penetrate it; but by calcination such soils become fertile. Will his fertilizer effect this? And ought we to waste our money for things not needed? All his formulas embrace nitrogen, potash, and carbonic acid—excellent things in their proper place; but all of these cannot always be wanted, nor can they be often wanted in such quantities as he has prescribed, for all soils are not barren or alike.

Charles M. Hovey said that both Mr. Fuller and himself had fallen into the same train of thought. He had discussed this subject many years ago in the "Magazine of Horticulture." He thought a chemical analysis of a soil entirely unnecessary to a man of good judgment. Mr. French, in his paper, had stated that the fertile soils of the Scioto valley, by analysis appeared scarcely different from the fertile soils of New England. All cultivators of plants in pots believe that a virgin loam is necessary to success. Much depends on the physical and mechanical condition of the soil; it must be aërated as well as enriched, and Mr. Hovey

thought Jethro Tull, who believed that deep and thorough tilling of the soil would supersede the necessity of manure, was nearer the truth than some of our modern professors with their chemical fertilizers. We have been told that only four persons failed out of a hundred who used the Stockbridge fertilizers last season, but those who did not fail have not told us what good, deep, thorough tillage would do on the same soil without fertilizers. The published experiments were, too many of them, *ex parte*.

Leander Wetherell read from an address by Prof. Stockbridge, as given in the "Report of the Secretary of the Massachusetts Board of Agriculture for 1875–6," p. 23, and said that he could not see in this anything short of rendering barnyard manure nearly valueless. Prof. Stockbridge only uses three elements for all crops, like the doctor who prescribed calomel and bleeding for all his patients. Mr. Wetherell also quoted from the "Scientific Farmer" for December, an account of the application of the Stockbridge formula to a crop of grass which produced 1,950 pounds per acre more than the natural yield of the land. He had some land just in condition to use this formula, and he intended to give it a trial, though he had not much faith in it. Who can tell, when the increase in the crop is attributed to the three ingredients named in the formula, that it was not due to the sulphate of lime in the superphosphate? He could tell a story of a much greater increase in a crop of clover, than that in the "Scientific Farmer." He knew a piece of land which had been ploughed for seventy years, and was then sowed to clover, with gypsum, and produced three tons of cured clover to the acre, while a corner left without the gypsum produced only at the rate of one ton to the acre. It is recommended in using the Stockbridge formulas to leave three rows without the fertilizers, for comparison, but when the roots are running all through the ground, how can we know that they do not feed on the fertilizers? There is a looseness about these experiments that brings them within the domain of doubt. When you have applied the fertilizers, are you sure that the plants will take up every particle?

The President announced that this would close the series of meetings for discussion this season.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1876.

PART II.

BOSTON:
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TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

SATURDAY, May 6, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The President read a letter addressed to him by William Gray, Jr., presenting to the Society a copy of Alphand's "Les Promenades de Paris," and stated that this was the most valuable single work ever presented to the Society.

Voted, That the thanks of the Society be presented to Mr. Gray for his generous gift.

On motion of the Chairman of the Library Committee, the Librarian was authorized to have the volumes presented by Mr. Gray, bound.

The following named persons, having been recommended for membership by the Executive Committee, were severally elected:

HUGH MORRISON, of Gloucester.
THOMAS C. THURLOW, of Newburyport.
AARON DAVIS CAPEN, of Mattapan.
JOHN J. RICHARDS, of Boston.
LEONARD W. WESTON, of Lincoln.
FREDERICK MARSHALL, of Everett.
DR. HENRY P. WALCOTT, of Cambridge.

The Secretary read a letter from Dr. Jared P. Kirtland, of East Rockport, Ohio, an Honorary Member of the Society, giving an account of a curious hybrid between the Western Shag-bark and the Black Oak. The letter was referred to the Committee on Publication.

Adjourned to Saturday, June 3.

BUSINESS MEETING.

SATURDAY, June 3, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The Committee to nominate a candidate to fill the vacancy in the Committee on Gardens, presented the name of James Cruickshanks, and he was unanimously elected. It was voted that the Committee on Gardens have leave to elect a Chairman.

The following named persons, having been recommended by the Executive Committee were, on ballot, duly elected.

FRED W. KELSEY, of Waverly, N. Y.
MAHLON D. SPAULDING, of Boston.
WILLIAM GRAY, 3d, of Boston.

Meeting dissolved.

BUSINESS MEETING.

SATURDAY, July 1, 1876.

A duly notified stated meeting was holden at 11 o'clock, President PARKMAN in the chair.

Hervey Davis, from the Committee on Gardens, announced that that Committee had elected Joseph H. Woodford, Chairman.

Charles M. Hovey offered the following resolutions: —

The members of the Massachusetts Horticultural Society having learned with deep regret of the decease of Louis Van Houtte, of Ghent, Belgium, the eminent horticulturist, and a Corresponding Member of the Society: therefore,

Resolved, That in this event we recognize that overruling Power, who lets not even a sparrow fall without his knowledge.

Resolved, That the death of M. Van Houtte has left a void in the ranks of horticulturists, which it will be difficult to fill.

Resolved, That cultivators throughout the world recall with the greatest pleasure the energetic efforts of M. Van Houtte in the domain of horticulture; that to his extensive knowledge of plants,

his unremitting labors in their culture, his enthusiasm in their introduction, his unceasing efforts in the production of new varieties, and his earnest endeavors to popularize and render familiar a science so deeply promotive of pleasure and refined culture, all lovers of beautiful plants owe a debt of the deepest gratitude.

Resolved, That as a botanical traveller, as a zealous introducer of new plants, as a skilful cultivator, as the proprietor and director of the most extensive collection of plants in Europe, and as the author and editor of that most beautiful work, the "Flore des Serres," M. Van Houtte has made rich use of his talents, for horticultural advancement everywhere. As a patriotic citizen, and an upright, honest, and sincere man, his death will carry grief to every member of our association.

Resolved, That we tender to the family of the deceased our sympathies in their great bereavement.

Resolved, That these resolves be entered upon the records, and that a copy, in French, be forwarded to the family of the deceased.

Mr. Hovey added that in his horticultural labors M. Van Houtte was aided by the Belgian government in a manner entirely unknown to nurserymen here, yet, even making every allowance for this assistance, his achievements were extraordinary. Everything new seemed connected with him, — his was the great place from which has emanated almost everything new, not only of his own introduction, but everything originated or collected by others. It was very rarely that he sent out anything not of value, and he sometimes incurred the ill will of other nurserymen by condemning novelties which did not come up to his high standard. His establishment made Ghent a centre of horticultural interest. Mr. Hovey alluded to the many eminent horticulturists who had passed away since his recollection, — Knight, Van Mons, Loudon, and now Van Houtte, who has added so much to our gardens and pleasure grounds, — a man of rare talents, beloved by every one. In his early days, he was a botanical traveller in Brazil, and later he had a share in the establishment of the present liberal and enlightened government of Belgium. Mr. Hovey concluded by expressing his regret that Col. Wilder, who visited M. Van Houtte's establishment not many years ago, was not present to speak of him.

Edward S. Rand, Jr., in seconding Mr. Hovey's motion, said that he had hoped some one personally acquainted with M. Van Houtte would be present to perform that service. But though he

had not the pleasure of a personal acquaintance, he had had much correspondence with M. Van Houtte, and his letters were extremely interesting. Of late years he had given special attention to raising new varieties of gesneraceous plants, having acres of seedling gloxinias, of which he did not expect more than one in a thousand, or even one in ten thousand, to be of value. The last letter received from him by Mr. Rand, about two months previous, gave no premonition of his approaching end. He was one of the judges at the International Horticultural Exhibition which opened at Brussels on the 30th of April, and, though in ill health, performed the duties of that office. Mr. Rand concluded by presenting to the Society a copy of the addresses delivered at the funeral of M. Van Houtte.

The resolutions were unanimously passed.

Adjourned to Saturday, August 5.

BUSINESS MEETING.

SATURDAY, August 5, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

Agreeably to the Constitution and By-Laws, the President appointed the following named gentlemen a committee to nominate suitable candidates for the various offices of the Society: William C. Strong, Chairman, C. O. Whitmore, John G. Barker, John C. Hovey, C. M. Atkinson, J. H. Woodford, Waldo O. Ross.

AMOS STONE, of Everett,

was duly elected a member of the Society.

Adjourned to Saturday, September 2.

BUSINESS MEETING.

SATURDAY, September 2, 1876.

An adjourned meeting of the Society was holden at 11 o'clock. The President and Vice Presidents being absent, Charles M. Hovey was chosen President, *pro tem.*

John G. Barker, from the Committee on Nominations, reported a printed list of candidates for officers for the ensuing year.

Invitations were communicated, by the Secretary, from James H. Ricketts, of Newburgh, N. Y., to visit and examine his new seedling grapes; and from Alexander Whilldin, President of the Sea Grove Association, to attend the National Forest Convention, under the auspices of the American Forest Council, at Sea Grove, Cape May Point, N. J., September 7th and 8th, 1876, for the promotion of forest planting.

The thanks of the Society were voted for these invitations.

The following named persons, having been recommended by the Executive Committee, as members of the Society, were on ballot duly elected:

Mrs. J. W. Walcott, of Boston.
Charles J. Anderson, of Longwood.

Meeting dissolved.

BUSINESS MEETING.

Saturday, October 7, 1876.

A stated meeting of the Society, being the annual meeting for the choice of officers, was holden at 11 o'clock, President Parkman in the chair.

The Recording Secretary stated that due notice had been given of the meeting, in accordance with the Constitution and By-Laws.

The President appointed E. W. Buswell, John G. Barker, and John C. Hovey, a Committee to receive, assort, and count the votes given, and report the number. The polls were opened at ten minutes past eleven.

The following named persons, having been recommended as members by the Executive Committee, were on ballot duly elected:

D. R. Beckford, Jr., of Marblehead.
Alfred J. Edmonds, of North Easton.
Mrs. L. P. Weston, of Danvers.
O. B. Hadwen, of Worcester.
H. A. Lothrop, of Sharon.
Otis Hinman, of Chelsea.

The polls, for the election of officers, were closed at ten minutes past twelve. The Committee reported the whole number of votes to be 93; necessary for a choice 47, and that all the gentlemen named on the ticket presented by the Nominating Committee had that number and were elected.

Adjourned to Saturday, November 4.

BUSINESS MEETING.

SATURDAY, November 4, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

A letter was read from John C. Chaffin, conveying his declination to serve on the Committee for Establishing Prizes, and C. M. Hovey, W. C. Strong, and John Robinson, were appointed a Committee to retire and report the name of a candidate for the vacancy, to be voted for at this meeting. The Committee subsequently reported the name of P. B. Hovey, who was unanimously elected.

The President, as Chairman of the Executive Committee, reported a recommendation that the following named amounts be appropriated as prizes for the year 1877, and stated that the reduction in the sums was caused by a diminution in the income of the Society:

For Flowers,	$3,000
Fruits,	1,900
Vegetables,	1,000
Gardens,	200
Total,	$6,100

W. C. Strong, from the Committee to whom was referred the subject of an award to Edward S. Rand, Jr., for his services to the Society as Recording Secretary for the past eight years, reported, recommending the presentation to Mr. Rand of a silver salver of the value of one hundred dollars. The report was accepted.

Charles M. Hovey presented the following resolutions in memory of John Fisk Allen, and moved their adoption:

The Society have learned with deep regret of the decease of John Fisk Allen, of Salem, a member of the Society: therefore,

Resolved, That by his death the members are reminded of the

active labors of the old members in the early days of the Society, and particularly of those of Mr. Allen, who, in his specialty of grape culture, was highly instrumental in encouraging and extending the growth of fine grapes.

Resolved, That to his enthusiasm and labors we are indebted for some of our best hybrid grapes, his exertions in their production stimulating others to like attempts, and we may date the interest in the production of new grapes from his early efforts in that direction.

Resolved, That as the first person to introduce and cultivate that magnificent lily, the *Victoria regia*, in our State, he achieved the highest success, and contributed both to the pleasure and instruction of the citizens of his native city, as well as to that of the members of this Society, before whom it was exhibited, and to that of the lovers of beautiful flowers every where.

Resolved, That the sympathies of the members be extended to the bereaved family, and that these resolutions be entered upon the records of the Society.

Mr. Hovey remarked that the circle of cultivators contemporary with Mr. Allen, was narrowing, and spoke, also, of the folio volume, illustrated with beautiful plates, in which the results of Mr. Allen's culture of the *Victoria regia* were recorded, the copy of which, now in the library of the Society, was presented by the author.

Robert Manning seconded the resolutions, and spoke of the liberal contributions made to the exhibitions of the Society, in years past, by Mr. Allen, it being no unusual thing for him to place on the tables, at one time, twenty or more varieties of grapes, and the latest specimens from his retarding house being scarcely gone before those from the earliest forcing house came in. He also alluded to Mr. Allen's continued interest in the Society, as manifested by occasional visits long after failing health precluded him from taking an active part in its work. The last of these visits was on the 30th of September, when he presented specimens of a seedling grape; and, in answer to an inquiry by Mr. Manning, stated that he had tested in his houses four hundred varieties of the European grape, which was believed to be a greater number than have been tested under glass by any other cultivator in the world.

John Robinson spoke of Mr. Allen's culture of the *Victoria regia*, and of his vivid recollection, as a boy, of visiting the house where that wonderful flower was growing.

William C. Strong remarked that at the time when Mr. Allen was so largely engaged in fruit culture, a prize was offered by the Society for the best display of fruit during the season, which was taken year after year by Mr. Allen, who exhibited not only grapes but forced cherries, peaches, and nectarines; figs, pineapples, pears, etc. Mr. Strong said that we have no such zealous cultivator of the grape among us now, and that we have occasion to hold Mr. Allen's memory in grateful remembrance.

James Cruickshanks spoke of the time when he heard of Mr. Allen's success in the cultivation of the *Victoria regia*, and went down to Salem to see it, and said that he should never forget the kindness and attention shown him by Mr. Allen.

The resolutions were unanimously adopted.

Adjourned to Saturday, December 2.

BUSINESS MEETING.

SATURDAY, December 2, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The part of the Schedule of Prizes relating to Flowers and Fruits was presented by the Executive Committee. The part relating to Vegetables and Gardens was not ready.

Hervey Davis, Chairman of the Committee for Establishing Prizes, stated that a question had arisen in regard to the construction of the words "a public trial" in the offers of Prospective Prizes, and asked the ruling of the Society thereon. The subject was fully discussed by C. M. Hovey and John C. Hovey, who argued that an exhibition on the tables of the Society for the specified time would meet the requirements of the rule; and by W. C. Strong, P. B. Hovey, J. H. Woodford, and F. W. Kelsey, who took the view that new seedlings should be publicly distributed and tested by others than the originators before receiving a Prospective Prize. After several motions had been submitted and withdrawn the subject was, on motion of Mr. Davis, referred to the Executive Committee.

The Chairman of the Committee on Plants and Flowers was allowed another week to complete his report.

J. H. Woodford, Chairman of the Committee on Gardens, read the Annual Report of that Committee.

Benjamin G. Smith, of the Committee on Fruits, read the Annual Report of that Committee.

C. H. B. Breck, Chairman of the Committee of Arrangements, read the Report of that Committee.

Charles N. Brackett, Chairman of the Committee on Vegetables, read the Annual Report of that Committee.

These reports were severally accepted and referred to the Committee on Publication.

Adjourned to Saturday, December 9.

BUSINESS MEETING.

SATURDAY, December 9, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The President, as Chairman of the Executive Committee, reported the Schedule of Prizes for 1877, with the approval of the Committee.

Also, in regard to the subject referred to the Committee at the last meeting of the Society, reported that it would be for the interest of the Society that the strictest construction be placed upon the words "a public trial," and that any product offered for a Prospective Prize should have been tested by the public.

W. C. Strong moved that the report be accepted and laid on the table. The motion was seconded by C. M. Hovey, with the understanding that the construction reported by the Executive Committee apply to the awards concerning which the question had arisen.

E. S. Rand, Jr. made a personal explanation of his position with regard to the Prospective Prize awarded to him.

Mr. Strong declined to accept Mr. Hovey's amendment, and after some remarks by J. B. Moore, J. G. Barker, and W. C. Strong, the amendment was withdrawn, and Mr. Strong's motion was unanimously passed.

It was then voted to take up the question of confirming the award of Prospective Prizes, by the Committee on Flowers.

It was moved by James Cruickshanks, and seconded by J. B. Moore, that these awards be confirmed. The subject was discussed by Messrs. Strong, Barker, C. M. Hovey, and N. B. White, and the motion was carried.

John G. Barker, Chairman of the Committee on Plants and Flowers, read the Annual Report of that Committee.

Edward S. Rand, Jr., Chairman of the Committee on the Library, read the Annual Report of that Committee.

These reports were severally accepted and referred to the Committee on Publication.

C. M. Hovey, Chairman, *pro tem.*, of the Special Committee on the exhibition of Massachusetts Fruits at the Centennial Exposition, presented the Report of that Committee, which was read by the Secretary. Permission was granted to the Committee to add to the Report the list of awards to contributors from Massachusetts by the Centennial Commission, when it should be received, and the report was accepted and referred to the Committee on Publication.

The Report of the Committee on Publication and Discussion was, at the request of the Chairman of that Committee, presented by the Secretary, who also stated that his own report was ready. The reading of these reports was deferred until the next meeting.

The meeting was then dissolved.

REPORTS.

REPORT

OF THE

COMMITTEE ON PLANTS AND FLOWERS,

FOR THE YEAR 1876.

BY JOHN G. BARKER, CHAIRMAN.

We present our report of the exhibitions with a feeling of satisfaction that this department has been so well sustained. Those who in past seasons have been regarded as regular contributors, have continued to perform their part faithfully and well. The impromptu exhibitions have been very interesting, and many objects of special merit have been shown during the early months of the year. We regret to report that the opening of the premiums to all has not resulted in the increased competition that was anticipated, and it is also with much regret that we have to report that the special prizes offered for Pelargoniums have been withdrawn, for the reason that there was but little or no competition for them. The liberal premiums offered by the Society will be continued as heretofore, and we hope that another year may witness increased competition by the cultivators of this beautiful and useful plant.

The Rose Exhibition was a decided success; at no time has there been so fine a display of the Queen of Flowers, as at the last exhibition. The manner of showing the roses in boxes, instead of bottles as heretofore, gave much satisfaction, the flowers showing to greater advantage. We are glad to know that there is much enthusiasm among the rose growers, and we have no doubt that the coming season will witness a superior exhibition in every respect.

The weekly exhibitions have been well attended and interesting, and there has been a good competition for the various prizes offered from week to week.

The Annual Exhibition was also a very gratifying success; although there were not as many large plants as there have been at some of the exhibitions, they were unusually good, and it is not too much to say, that there was not a poor plant in the hall; any one selected from any of the collections would have made a good specimen plant. It was very gratifying to see the plants so well furnished with good foliage, and void of long legs and injured foliage. Who would not prefer a small, handsome specimen, to one that must be measured by the yard to get at its size?

We were also glad to get back to our own hall again, and, although some doubted very much the wisdom of the change of the place for the plants, from so large a room as Music Hall to our own Lower Hall, it seemed to give general satisfaction, particularly as it saved the labor of carrying them up another long flight of stairs, which was found a heavy task when the flower show was held in the Upper Hall.

Cyclamens.—The exhibitors were C. B. Gardiner and James O'Brien, but, although good plants were shown, they were not equal to those of the two previous seasons. It is hoped that so beautiful a flower as the cyclamen may receive more attention from our cultivators, it being not only very useful to the florist, on account of its free flowering properties, but very valuable as a decorative plant.

Camellias were not shown in as large quantities as last season, but on the 11th of March, that being prize day, very fine collections were shown by C. M. Atkinson, of well known standard varieties, and by Hovey & Co., who, besides well known varieties, exhibited, also, the fine seedlings which have been described in previous reports.

November 11th, Marshall P. Wilder exhibited a seedling camellia in bloom, only two years and eight months from the germination of the seed. This was shown as a proof of the correctness of the belief expressed by Mr. Wilder, at one of our meetings for discussion, about two years ago, that seedling camellias and azaleas might, by grafting on older stocks, be caused to bloom in much less time than has generally been thought necessary.

Orchids have, as in past seasons, formed a very interesting and attractive feature of the exhibitions; particularly noticeable were the following named fine specimens from E. S. Rand, Jr.:

Cattleya amethystoglossa.—A magnificent species, blooming freely

from January to March. The flowers are blush, spotted with rich purple; lip rich rosy violet. For rich color of lip, this plant has no equal. This was the first time it had been exhibited.

Cattleya pumila.—A species of small growth. The plant shown was grown on a block of wood, and was about four inches high, with three flowers of a beautiful rose color, the lip being crisped, and in color crimson, edged with white.

Cirrhopetalum Medusæ.—Of this singular plant Williams says: "Amongst the strange and varied forms which the flowers of orchids present, this is certainly one of the most remarkable. The flowers, though not large, are very numerous, and part of the sepals are very much lengthened, so that the spike looks like a head with long hair hanging down, from which its name has been derived. It is a dwarf growing plant, with thick, fleshy leaves, and should find a place in every collection for its unique appearance." This was the first time it had been exhibited.

Cœlogyne cristata.—A nice plant, which was a fountain of snowy white blossoms.

Cypripedium Harrisianum.—A fine cross between *Cypripedium villosum* and *C. barbatum*, combining all the good qualities of both species. Flowers large, shining, dark purple, brown, green and yellow; foliage long, mottled. This is a very free growing plant, and will make a superb specimen. It blooms freely from November to March. We consider it one of the best of the family.

Cypripedium insigne.—Although an old species, this is one of the best. The plant shown was in very fine condition, with thirty flowers.

Dendrobium Jenkinsii.—A fine dwarf evergreen species, about two inches high. Flowers very large for the size of the plant; pale buff, edged with yellow. It blooms in midwinter and will grow on a block of wood suspended from the roof.

Lælia anceps.—A very handsome orchid from Mexico. Perianth lilac rose; lip rich velvety purple outside, marked with crimson and veined with yellow inside.

Lælia pedunculatis.—Flowers delicate rosy purple, with a deep purple spot on the centre of the lip. A very neat growing, free flowering species.

Odontoglossum pulchellum.—Exhibited for the first time. A very handsome plant with five spikes of pure white flowers, having the crest of the lip crimson. The flowers are very fragrant and the plant is of neat habit, and is one of the best cool house orchids.

Phalœnopsis Schilleriana.—Leaves very large, dark green, mottled with gray or white. Flower stems from one to three feet long, much branched, and covered with multitudes of lovely flowers from two to three inches in diameter, of delicate shades of mauve, edged with white, yellow toward the base, with reddish crimson spots. It is one of the most beautiful of all the orchids, and the specimen shown was the first exhibited here.

Saccolabium giganteum.—A very beautiful species with luxuriant foliage, producing long racemes of thickly set flowers. Sepals and petals white, the latter spotted with lilac; lip lilac and violet. The flowers are very sweet and continue in bloom a long time.

March 11th being prize day for Winter Blooming Orchids, Mr. Rand exhibited *Dendrochilum glumaceum*, *Lycaste Skinneri*, *Cypripedium villosum*, and *Dendrobium nobile*, which were described in our last report. Also the two following, both exhibited or the first time.

Lælia flava.—A very pretty plant, bearing in March a profusion of bright canary-colored flowers. A desirable species, growing freely and always giving good bloom.

Lycaste cruenta.—Perianth apple-green; lip yellow, with dark spot. Flowers very freely in March and April, and is a desirable species.

Mr. Rand has also exhibited at various times the following,—

Aerides Fieldingii,—One of the finest orchids in cultivation, commonly known as the Foxbrush Aerides. The plant grows three or four feet high, and produces, in great profusion, long branching spikes of white rosy-spotted flowers, often clear bright rose.

Saccolabium retusum.—A stout growing species, producing in early spring long spikes of white flowers, spotted with delicate rose.

Zygopetalum rostratum.—Perianth yellowish green; lip white, varied with rose.

Chysis bractescens.—Flowers large, white, with a blotch of yellow on the lip; very fragrant. A beautiful and free growing species.

Saccolabium curvifolium.—Very rare and shown for the first time. Flowers bright vermilion, very rich. It is a charming little plant.

Vanda cœrulescens.—A little gem of a plant. Foliage narrow; flowers on a very long spike, lilac blue, with rich deep blue lip. The individual flowers are small, but the spike is many flowered, and the colors are very attractive. A very nice plant with two spikes of flowers was shown.

Phalænopsis Luddemanniana.—A plant resembling *P. rosea*, but with lighter foliage. Racemes about twelve inches long; flowers two inches across, blush, barred throughout with amber and amethyst, varying to a bright rose color. The plant exhibited was a small one with two flowers, grown in a basket. It had never been exhibited here before.

Cypripedium niveum. New.

July 22d being prize day for Summer Orchids, Mr. Rand exhibited the six following named varieties.

Vanda suavis.—Perianth white outside, tinted with rosy carmine; lip lilac, tipped with white; flowers very fragrant. The plant shown was a very beautiful specimen, and the species had never been exhibited here before.

Oncidium flexuosum.

Dendrobium calceolare.

Cattleya guttata Leopoldii.

Miltonia spectabilis.

Epidendrum ciliare.

Also, *Dendrobium Devonianum.*—This species blooms along the stem, which is often several feet long. The flowers measure two inches across; the ground color is white, the sepals tipped with violet rose; petals larger than the sepals, pink, with a vivid violet spot at their base; lip beautifully fringed, white, with two bright yellow spots at the base, and a rich violet spot at the tip. This is one of the best of the *Dendrobiums.*

Oncidium Limminghei.—A minute species resembling a *Sophronitis;* flowers large, bright golden, with crimson spotted lip. A little gem of a plant.

We desire to call particular attention to a fine new *Cattleya* exhibited by Mr. Rand, February 12th. The plant was received from Messrs. Hugh Low & Son, of Clapton nurseries, London, who sent it to Mr. Rand to fill an order for six plants of *Cattleya Trianæ*, writing that they preferred to send one very fine plant rather than six small ones. It had just been received by Messrs. Low from South America and had not bloomed in England. In habit the plant appears to be a very strong growing *C. Trianæ;* the leaves are very long, thick, and very dark green; the flowers (two to four on a spike) very large, opening flat, five to six inches in diameter, sepals blush white, petals pinkish amethyst; lip very large, yellow at base, shading to deep mauve at the tip; beautifully frilled. The

flowers are exquisitely fragrant, and remain six weeks in perfection. The plant exhibited was two feet in diameter and bore sixteen expanded flowers. It is doubtless a natural seedling hybridized by insect agency from *C. Trianæ*, and has been named *Cattleya Trianæ Daisy*. Mr. Rand also showed flowers of the type *C. Trianæ* from a plant which came from Prof. Reichenbach, the greatest living orchidologist.

F. L. Ames exhibited the following new and rare species.

Cypripedium longifolium.—This is not a showy species, but it is a desirable one, as it is said never to be out of flower. The flowers are greenish white and brown, many on a spike; foliage long, dark green.

Cypripedium Dominianum.—A cross between *C. caricinum* and *C. caudatum*. Spike three flowered; petals yellowish green, very long; lip purple, green, and yellow.

Dendrobium M'Carthiæ.—A very beautiful plant, producing bright cherry red flowers, which last long in perfection; lip white and purple. It is a free grower and produces abundance of flowers.

James Comley has also exhibited *Cymbidium aloifolium*, a very pretty orchid from the East Indies, and *Aerides odoratum*, a very interesting orchid from India.

Indian Azaleas.—The exhibition of Azaleas occurred on the 8th of April. The exhibitors were Marshall P. Wilder, J. B. Moore and Hovey & Co., each of whom exhibited good collections of plants. Although there have not been as many good specimen plants exhibited as there were the preceding season, there were many fine plants shown, most noticeable among them being the following varieties from Marshall P. Wilder, the descriptions of which may be found in some of the leading catalogues.

Alba illustrata plena.	M'lle Louise de Kerchove.
Baron de Vrière.	Marie Le Febvre.
Bernhard Andrea.	Neptune.
Bernhard Andrea alba.	President Claeys.
Countess of Beaufort.	Punctulata variegata.
Eugénie de Kerchove.	Rachel von Varnhagen.
Juliette.	Roi de Belgique.
La Victoire.	Sigismond Rucker.
Madame Mendel.	Souvenir de Maximilien.

The varieties from James Comley were mostly the same as those

shown by him last season, which were fully mentioned in our last report; the plants were small, but the varieties were showy and distinct.

Hovey & Co. have exhibited from their extensive collection, besides other varieties, plants of

Bijou de Paris.	Mad. Vandercruyssen.
Constant van Keirsbilck.	Monstrosa.
Flag of Truce.	Souvenir de Maximilien.
La Victoire.	William Tell.
Mad. Marie Van Houtte.	

No better plants have ever been exhibited than those from J. B. Moore; the varieties shown were Stella, a very fine specimen, three feet high and very handsomely proportioned, also, Étoile de Flandre, Mad. Marie Lefebvre, Marie Vervaene, Todmanii, Juliana, and La Déesse.

February 12th, John F. Rogers exhibited a specimen plant of Criterion, a well-known variety; this plant was four feet high, four in diameter and ten in circumference, and was in very fine condition. June 10th, another splendid specimen was shown by C. M. Atkinson, the variety being Decora. The plant was six feet high, four in diameter, and twelve in circumference, and was one of the best specimens ever exhibited. The contrast of the richly colored flowers with the healthy foliage rendered it an object of great beauty.

Hovey & Co. exhibited a seedling azalea, of which the Committee have made the following description from notes furnished by C. M. Hovey. It is a hybrid raised a few years since between *Azalea amœna* and *A. Indica*, the object being to produce a variety as dense and dwarf in growth as *amœna*, and flowering as freely and as early, but with flowers of a brighter or lighter color. This object has been partly accomplished, the habit of the seedling being even more dense and dwarf than that of *amœna*, and it is also a more profuse bloomer, while the flowers are somewhat larger, and single like those of *A. Indica*, with a larger tube, which gives them a free and loose appearance, unlike the stiff set blooms of the female parent. The color is a clear pale rose, or rosy lilac, and the plant when in full bloom is literally covered with flowers.

It is hardly possible, in a brief space, to do justice to a plant so useful and ornamental as the azalea. Nothing can be grander than the

superb specimens which have been shown at our exhibitions from year to year, presenting the greatest variety of color, from crimson to the purest white. Nor is it for exhibition purposes alone that it is chiefly valuable; for the amateur, who does not grow plants for exhibition, but wishes to keep his greenhouse or conservatory bright with flowers through winter and spring, nothing answers the purpose so well as the azalea. With a little careful management, by either forcing or retarding, it may be had in bloom from January to June. May we not hope that the many florists and amateurs who are making a specialty of the azalea may be induced to contribute even more liberally in the future than in the past to our exhibitions?

CINERARIAS.—The only exhibitor was C. M. Atkinson, who brought six well grown specimen plants. It is surprising that such beautiful and showy plants, which present a great variety of color, and so well repay the grower for the time and trouble taken to produce them, should receive so little attention.

POLYANTHUS.—No better plants have ever been shown than the six from C. M. Atkinson. The polyanthus is one of our best spring flowering plants, and should be in every collection.

PANSIES—Six well grown pots were shown by C. M. Atkinson, May 6th; also dishes of Odier and French pansies by D. Zirngiebel, and several dishes by various other contributors.

AMARYLLIS.—The premiums offered have so far failed to draw any competition, but at different times during the early part of the season some very fine plants, as well as cut flowers, were shown. Francis Putnam, who is quite an enthusiast over this beautiful plant, has exhibited a very good lot of seedlings, mostly varieties of *vittata*. While all were worthy of cultivation very few were distinct from the many named varieties we already have. One exception we must mention—a very fine seedling, exhibited by Mr. Putnam on the 19th of February; the flower was very large, color cherry scarlet, veined with white, each petal having a broad white stripe through the centre. It was awarded a First Class Certificate of Merit. Mr. Putnam also exhibited Amaryllis Bayard, Phœbus, Mrs. Kimball, and Johnsonii.

From J. B. Moore we have had well grown plants of Artemesia, Cleopatra, Regina, Aurora, Bayard, and Halfordii.

PELARGONIUMS.—The special prize day was May 13th, and the exhibition was one of the best ever made. Although the plants were hardly equal to those shown last season, they still made a very

brilliant display. The exhibitors were Wm. Gray Jr., Hovey & Co., and James Comley. We omit the lists of names as the varieties were very much the same as those shown last year, of which full lists were given.

At the Rose Exhibition, June 21st, H. H. Hunnewell exhibited six very fine Variegated Zonales. The plants from Mr. Hunnewell are always first-class in every respect, and at all times a great addition to the shows.

The Pelargonium Exhibition is one of the most important now held by the Society, and for its success we are largely indebted to that enthusiastic amateur, William Gray, Jr. As the plants are so easily grown and there are many good collections in our vicinity, we trust that the future exhibitions will show increased competition over the successful ones already held.

Show and Fancy Pelargoniums.—The only plant shown was a very fine standard from C. M. Atkinson, on the 25th of March. It was five feet high, with a well formed head; the foliage was very luxuriant, and was intermixed with an abundance of bloom. The variety was Belle of Paris.

Spring Herbaceous Plants. — E. S. Rand, Jr., showed a very fine collection of sixty-five species and varieties; a list of them is appended, and will prove a valuable help to those who are about making up collections.

Anemone nemorosa.
" " *purpurea* (English).
Aquilegia Canadensis.
Asarum Canadense.
Corydalis aurea.
" *nobilis.*
Dicentra Cucullaria.
" *eximia.*
Epimedium sp.
Erythronium albidum.
" *Dens canis.*
Ficaria ranunculoides.
" " *fl. pl.*
Fragaria Virginiana.
Geum rivale.
Gnaphalium sp.
Hepatica acutiloba.
" *triloba.*
Houstonia cœrulea.
Iris pumila.
Jeffersonia diphylla.
Orobus vernus.
Pachysandra procumbens.
" " *variegata.*
Pæonia tenuifolia.
Phlox nivalis.
" *subulata*, 2 var.
Podophyllum peltatum.
Polemonium reptans.
" *Virginica.*
Potentilla sarmentosa.
Primula veris.
" *Polyanthus.*

Sanguinaria Canadensis.
Saxifraga Virginica.
Trillium erectum.
" *grandiflorum.*
" *sessile.*
Uvularia grandiflora.
" *sessilifolia.*
Viola blanda.
" *Canadensis.*
" *cucullata.*
" *odorata alba.*
" *sagittata.*
" *tricolor*, 10 var.

CALCEOLARIAS. — Six well grown plants were shown by C. M. Atkinson. Perhaps no plant in cultivation possesses so much richness and variety of color in its blossoms as the Calceolaria, and when we consider the ease with which it is cultivated, it is surprising that so few have been exhibited.

TREE PÆONIES were shown by Marshall P. Wilder and Hovey & Co. The large collections grown by these gentlemen enable them always to make very fine displays.

HARDY SHRUBS. — A very good collection of cut flowers was shown by Miss A. C. Kenrick, consisting of varieties of Azaleas, Hawthorns, Spiræas, Lilacs, Dutchman's Pipe, Weigelias, Calycanthus, etc. Miss S. W. Story also had a small collection.

RHODODENDRONS. — June 3d being the regular prize day, E. S. Rand, Jr., exhibited a very fine collection, the names of which are given below. Considerable pains have been taken to prepare these lists, and it is hoped that they may be useful to the members of the Society. (h., hardy; h. h., half hardy; p. h., probably hardy; t., tender.)

Album.—White; h.
" *elegans.*—Blush white; h.
Atrosanguineum.—Blood red; h.
Aucubæfolium.—Lilac; h.
Bicolor.—Rose with white spot; h.
Brayanum.—Rosy scarlet; t.
Candidissimum.—White; h. h.
Charles Dickens.—Dark scarlet; p. h.
Congestum roseum.—Light rose.
Coriaceum.—Pure white; h.
Cunningham's Dwarf White.—White; h. h.
Delicatissimum.—Blush white; h.
Everestianum.—Rosy lilac, fringed; h.
Giganteum.—Bright rose; h.

Glennyanum.—Blush; t.
Grandiflorum.—Rose; h.
Hannibal.—Fine rose; h.
Kettledrum.—Fine red.
Lady Armstrong.—Pale rose with dark spots; p. h.
Lady Emily Peel.—Rose with chocolate spots; t.
Lee's Dark Purple.—h.
Leopardi.—Rosy lilac, spotted; h. h.
Limbatum.—White with crimson edge; t.
Londinense.—Purple with light centre; t.
Lucidum.—Purplish lilac; t.
Marc Antony.—Lilac; p. h.
Mrs. Milner.—Crimson; very fine; p. h.
Mt. Blanc.—White; p. h.
Neige et Cerise.—White with crimson edge; t.
Onslowianum.—Waxy blush with yellow eye; t.
Perfection.—Blush with yellow eye; t.
Perspicuum.—Blush; t.
Purity.—White with yellow eye; t.
Purpureum elegans.—Fine purple; h.
" *grandiflorum.*—Purple, large truss; h.
Reedianum.—Cherry red; t.
Rosabel.—Pale rose; t.
Roseum elegans.—Rose; h.
" *grandiflorum.*—Rose; h.
" *pictum.*—Rose; h. h.
" *superbum.*—Light rose; h.
R. S. Field.—Fine scarlet; t.
Sir Isaac Newton.—Spotted purple; h. h.
Splendens.—Rose; h.
Stella.—Rose with chocolate marking; p. h.
Sultana.—White with brown spots; t.
Verschaffeltii.—Purplish blush; t.
Victoria.—Deep claret color; t.

On account of the lateness of the season, the Hunnewell Special Prizes were not awarded until June 10th. The exhibitors were E. S. Rand, Jr., and Joseph Clark. In addition to those already named, Mr. Rand exhibited very fine trusses of

Alarm.—Crimson and white; t.
Archimedes.—Rosy crimson; h. h.

Bertie Parsons (Parsons).—White and mauve; h.
Blandyanum.—Rosy crimson; h. h.
Broughtoni.—Rosy crimson; t.
Bylsianum—White and pink; very fine; t.
Caractacus.—Rich purplish crimson; h. h.
Charles Bagley.—Cherry red; t.
Columbus.—Rosy purple; h. h.
Crispiflorum (Parsons).—Purplish; h.
Cruentum.—Rich lake; t.
Decorator.—Clear rose; t.
Desdemona.—Blush; t.
Duchess of Sutherland.—Rosy lilac; t.
General Cabrera.—Crimson; t.
Guido.—Crimson; t.
H. H. Hunnewell.—Rich crimson; h. h.
H. W. Sargent.—Crimson; p. h.
James Bateman.—Rosy scarlet; t.
John Waterer.—Dark crimson; t.
Lady Clermont.—Rosy scarlet and black; t.
Lady Godiva.—White and yellow; t.
Lord Clyde.—Deep blood color; t.
Lord John Russell.—Red spotted; t.
Magnum Bonum.—Rosy lilac; p. h.
Milnei.—Rosy crimson; p. h.
Mrs. John Clutton.—White; very fine; t.
Mrs. Thomas Wain.—Pale rose; t.
Nigrescens.—Purple, almost black; h. h.
Othello.—Crimson; t.
Paxtoni.—Deep rose; h. h.
Scipio.—Rose, finely spotted; t.
Surprise.—Lilac; t.
Sidney Herbert.—Crimson with dark spots; t.
Titian.—Rosy scarlet; fine; t.

We are not able to give a list of the varieties shown by Mr. Clark, as none was handed the Committee.

H. H. Hunnewell also exhibited a superb lot of rhododendrons, but we have no list of the varieties. To Mr. Hunnewell, more than to any other person, are we indebted for the increased interest in the cultivation of the rhododendron.

On Saturday, June 17th, Mr Rand again exhibited a very fine

lot of rhododendrons, comprising, with others, many of the varieties already named.

The display of rhododendrons the present year has been remarkably fine; in size of truss, perfection of individual flowers, and profusion of bloom it has never been surpassed. It is much to be regretted that this plant, so ornamental in foliage and showy in flower, is not generally grown. The hardy varieties, once well established, require no care, and the tender are very easily grown, and only require winter protection.

The Committee have awarded to E. S. Rand, Jr., the Society's Prospective Prize, for the best Seedling Hardy Rhododendron, for the variety named Daisy Rand, which has been shown at our exhibitions for the last six years. The plant has been examined in Mr. Rand's grounds, where it has stood in a most exposed situation, wholly unprotected, for the last twelve years. The following description has been made by the Committee, from notes furnished by Mr. Rand:

The plant is of dwarf habit, but very spreading and short jointed; foliage very large, oval, bright polished green on the upper surface, and very white below. It is very floriferous, the smallest branches carrying trusses of bloom, which are large, full, and globular. The individual flowers are of great substance, and last very long in perfection, as proved by the fact that trusses from the same plant were shown this year at our exhibitions on three successive Saturdays. The flower is rosy scarlet with light centre, the upper petals being profusely spotted with chocolate. We regard this variety as a most valuable addition to our shrubs.

Hardy Azaleas.—E. S. Rand, Jr., E. Shepherd, and B. G. Smith were the exhibitors, and the same remarks that we made in regard to the rhododendron will apply equally to the azalea. The collections exhibited were unusually good, that of Mr. Rand being the largest. We again express our hope that the very liberal premiums offered by Mr. Hunnewell for rhododendrons and azaleas, will bring out a much larger competition than we have had the past season.

Roses.—As was predicted in our last report, the Rose Show was, without doubt, the best ever held by the Society; the Queen of Flowers was present in her best attire. For the Society's prizes, William Gray, Jr., James Comley, J. H. Woodford, J. B. Moore, C. M. Atkinson, Francis Parkman, and Joseph Clark were the competitors.

We append, for the benefit of those about making up a collection of roses, a list of the best twenty-four varieties shown, and we feel sure that no one will be disappointed in the selection, it being the result of years of experience of one of the most enthusiastic of amateurs, William Gray, Jr.

Alfred Colomb.—Bright, light crimson; large and full, fine form.

Baronne Prévost.—Pale rose; very large and full.

Caroline de Sansal.—Clear flesh, blush edges; large and full.

Comtesse d'Oxford.—Bright carmine red, shaded; large, full and fine form.

Dupuy-Jamain.—Very bright cerise; large, full and fine form; blooms freely.

Edouard Morren.—Glossy pink; in the way of Jules Margottin, but of a fresher and more delicate color; of better form, and much larger; very fine.

Etienne Levet.—Carmine; large; full, fine form.

Felix Genero.—Beautiful violet; large, full and globular form; one of the best.

Ferdinand de Lesseps.—Dark purple, shaded with violet; large and fine.

Fisher Holmes.—Magnificent scarlet red; imbricated, large and full; form like a camellia.

General Jacqueminot.—Brilliant scarlet crimson; large and magnificent.

John Hopper.—Rose, crimson centre; large, full and good.

Jules Margottin.—Brilliant glossy pink; flowers large, smooth and cupped; a superb rose.

La France.—Beautiful pale peach, rose centre; very large and full; free bloomer, a good bedding and decorative rose.

La Reine.—Rosy pink, tinged with lilac; very large.

Mad. Laurent.—Beautiful cherry red; full, large, and very fine.

Mad. Marius Cote.—Clear red; full; a fine open flower.

Mad. Rothschild.—Beautiful bright rose, shaded with white; very large; handsome foliage.

Mad. Victor Verdier.—Beautiful cherry rose; large and full; form exquisitely cupped.

Marquis de Castellane.—Bright clear rose; large and full; fine form.

Mrs. Laing.—Bright carmine rose; medium size; free grower.

Paul Neron.—Dark rose; extra large; fine form and habit.

Paul Verdier.—Bright rose; large, full, and finely imbricated.

Perfection de Lyon.—Bright rose, reverse of the petals lilac; form cupped, large and full.

The collections of twelve, six, and three, were all unusually good, but not distinct enough from those already named to require special mention.

Moss Roses.—President Parkman has expressed our opinion of the Moss Rose so well in his excellent "Book of Roses," that we are sure he will pardon us if we give our ideas in his words: "At the present day, when the annual progeny of new Perpetual roses from the nurseries of France, with a humble reinforcement from those of England, has eclipsed by numbers the old garden favorites, the well-remembered roses of our infancy, the Moss alone stands in tranquil defiance of this gay tide of innovation. Nothing can eclipse and nothing can rival her. She is, and ever will be, the favorite of poetry and art; and the eloquence of her opening buds, half wrapped in their mossy envelope, will remain, throughout all generations, a chosen interpreter of the language of youth and beauty."

We are glad to report that a very fine collection of Moss roses was shown by C. M. Atkinson. The following is a list:

Celina Moss.	Lanei Moss.
Common Moss.	Marie de Blois.
Crested Moss.	Mad. Albani.
Denis Helye.	Oscar Leclerc.
Glory of the Mosses.	Princess Adelaide.
James Veitch.	

Tender Roses.—The best twelve named varieties were shown by James Comley; also the best twelve Marshal Niel, which were exceedingly fine.

General Display.—The extent of this display was unusually large and fine. The names of Francis Parkman and Joseph Clark are a sufficient warrant of the character of the flowers placed upon the stands.

Hunnewell Special Prizes.—For the best six new varieties sent out since 1872, William Gray, Jr., contributed the following:

Captain Christy.—Delicate flesh color, rose colored in the centre—a very effective new color; very large.

Etienne Levet.—Carmine; large, full, fine form.

François Michelon.—Floriferous; flowers large, full; fine deep red, reverse of petals, silvery.

Mad. Marius Cote.—Clear red, full.

May Turner.

Richard Wallace.—Flowers full, very well formed; bright rose, slightly edged white.

For the best six named varieties, William Gray, Jr., exhibited Charles Lefebvre, La France, Marquise de Castellane, Mad. Rothschild, Mad. Vidot, Victor Verdier.

From C. M. Atkinson, came Duchess of Edinburgh, John Harrison, Madame Nachury, Miller Hayes, Mlle. Dumaine, Thomas Mills.

For the best twelve of any one variety, William Gray, Jr., exhibited twelve fine specimens of Baronne Prévost.

GRAY SPECIAL PRIZES.—For the best twelve of any one variety, J. C. Chaffin exhibited a superb stand of Victor Verdier.

For the best six of any one variety, James Comley had an equally superb stand of Baronne de Rothschild.

For twelve named varieties, Francis Parkman exhibited the following named superb varieties, which were pronounced by all, the best twelve roses ever on exhibition. The varieties were

Alfred Colomb.	La France.
Annie Wood.	Leopold Premier.
Ardoisé de Lyon.	Maréchal Vaillant.
Charles Lefebvre.	Marguerite Dombrain.
Felix Genero.	Paul Neron.
Glory of Waltham.	Perfection de Lyon.

COMLEY PRIZE, FOR THE BEST SINGLE FLOWER.—There were several contributors, the successful one being J. C. Chaffin, with a very fine flower of Charles Lefebvre.

The Society is to be congratulated on the success of this show, and we trust that not only the exhibitors of the past season, but other rose growers, will add their productions to the future exhibitions.

In addition to his display at the regular Rose Show, James Comley has exhibited some very fine plants, grown in pots, of Hybrid Perpetuals, viz.:

Captain Christy.

Comtesse d'Oxford.

Elie Morel.

Mad. Larcharme.—White, very large, a first rate flower, the finest of its class.

Mad. Lefebvre Bernard.—Bright rose, tipped with white; fine bloomer, very large.

Paul Neron.

Prince Paul Demidoff.—Fine clear carmine rose; very large, full, fine form.

Princess Beatrice.—Light peach color; fine form.

Rosa Bonheur.

Souvenir de Gen. Douai.

Mr. Comley has also shown the following new Tea roses:

Catherine Mermet.—Light flesh color, large; a splendid rose.

La Jonquille.—Very yellow; medium flower, and said to be a good bloomer.

Mad. Charles.—Light yellow with salmon centre; large and well formed.

Triomphe de Rennes.

Marie Accary (Noisette).

From J. B. Moore we had fine plants of Hybrid Perpetual roses Duke of Edinburgh and Mad. Lacharme. Both of these plants were in admirable condition and full of fine flowers and buds. Mr. Moore has also exhibited very fine collections of cut flowers of choice Hybrid Perpetual roses, which for size of flower and fine form have seldom, if ever, been equalled. He has also shown the new Tea rose, Cheshunt Hybrid, the color of which, cherry carmine, is quite novel. It is a very fine rose.

W. H. Spooner and B. G. Smith, have each shown good collections of Hybrid Perpetual roses; L. H. Foster and Twombley & Sons, Bon Silene and Saffrano rose buds, and E. S. Rand, Jr., very fine dishes of Cherokee and Fortune's Double Banksia roses.

GLOXINIAS.—We regret to report that for the prizes offered there was no competition, except for the single specimen, Joseph Clark being the successful competitor with a fine plant.

J. B. Moore has shown some very good seedlings, making on the 29th of April a good display under numbers. The Committee considered the following as worthy of note: No. 2; medium sized flower, spotted throat, crimson lake, edge of petals faint lilac. No. 3; large flower, color crimson with deeper velvety crimson tube, white spotted throat. No. 5; large flower; color deep purple, with light violet edges, white throat. On the 15th of April Mr. Moore presented another fine seedling, a good flower, of fine substance, large, round, well opened; white throat shading to a purplish crimson, with delicate pink edges.

From James Comley we had three new varieties, Rev. H. Dombrain, Julie, and Caroline.

Wardian Cases.—W. H. Halliday, Hovey & Co., A. Greenlaw, and Carl Deeterich were the exhibitors. Mr. Halliday's cases are so well known that no comment on them is necessary; suffice it to say they were fine specimens of neatness and good taste. If there is any criticism at all to be made upon the others it is that the cases were so elaborate as to distract attention from the plants growing in them; but they were very handsome parlor ornaments.

Fern Cases were shown by W. H. Halliday, very neatly arranged with choice ferns and lycopods.

Sweet Williams.—There were several collections shown, but the best were from Joseph Clark and James Nugent, each having a good stand of fine distinct varieties, Hunt's Auricula Flowered largely predominating.

Summer Herbaceous Plants.—Francis Parkman and James McTear were the exhibitors. The stand from Mr. Parkman was an unusually good one, and contained a very choice collection of named varieties; the stand from Mr. McTear was also a very good one.

Delphiniums.—Francis Parkman showed a very fine collection, comprising some magnificent spikes of extremely rich and showy flowers. No one has done as much as Mr. Parkman to improve this valuable plant, and we are glad that his efforts are being rewarded by the production of such beautiful flowers as were shown on this occasion.

Late Phloxes.—A very fine display was made by several contributors; the best collections were from Francis Parkman and Hovey & Co., and were undoubtedly the best ever exhibited. Great improvement has been made in this valuable herbaceous plant, which for late summer flowers has no equal.

For the best Seedling Late Phlox, the Silver Medal was awarded to Francis Parkman, for a very fine flower marked No. 2; color bright rose, with brilliant scarlet eye; large and full. Mr. Parkman has also shown a very fine lot of seedlings in addition to the one just mentioned; particularly good were those marked F,—white with deep crimson eye, heavily flamed with the same color. J,—bright rose with scarlet eye; and D,—white, with dark rose eye. James Comley has also shown a very good lot of seedlings.

Petunias.—The best stands were those from E. W. Wood and

James Cartwright; there were other contributors, and the display this season was unusually good.

NATIVE FERNS.—An excellent collection was shown by Mrs. Horner, numbering some fifty species and varieties, all neatly and correctly named, which added very much to the interest of the collection. On the 27th of June, John Robinson exhibited thirty-three species and varieties of hardy North American Ferns; we append the list with the notes as given by Mr. Robinson, which we are sure will be of great interest to all. He says—

"These ferns have been grown in my garden for the number of years indicated by the figures placed against the names, without special care, and without any other protection during winter than a few leaves. Those marked with a star are ferns not yet fairly tested in my garden, though perfectly hardy in certain other localities.

Polypodium vulgare. 10.
Phegopteris Dryopteris. 10.
" *polypodioides.* 10.
Struthiopteris Germanica. 5.
Pteris aquilina. 4.
Adiantum pedatum. 9.
Woodwardia angustifolia. 5.
**Camptosorus rhizophyllus.* 2.
**Asplenium Ruta-muraria.* 1.
" *Trichomanes.* 5.
" *ebeneum.* 5.
" **angustifolium.* 2.
" *thelypteroides.* 5.
" *Filix-fœmina.* 10.
Dicksonia punctilobula. 5.
* *Woodsia obtusa.* 3.
Cystopteris fragilis. 10.
Cystopteris bulbifera. 5.
Aspidium Noveboracense. 5.
" *spinulosum intermedium.* 10.
" " *Boottii.* 5.
" " *dilatatum.* 10.
" *cristatum.* 5.
" " *Clintonianum.* 2.
" *Goldianum.* 2.
" *marginale.* 10.
" " *elegans.* 10.
" *acrostichoides.* 10.
Onoclea sensibilis. 10.
Osmunda cinnamomea. 10.
" *Claytoniana.* 5.
" *regalis.* 10.
" " var. 10."

On the 15th of July, George E. Davenport exhibited a very fine collection of Native Ferns, a list of which, with notes, he has prepared at our request.

" *Polypodium vulgare*, L.—A hardy evergreen species; common.
" *incanum*, Swz.—From Texas.
Gymnogramme triangularis, Klf.—From California.

Pellæa gracilis, Hook.—From Vermont; hardy.
" *atropurpurea*, Link.—From Syracuse, N. Y.; hardy.
" *ornithopus*, Hook.—From Yuba Co., California.
" *brachyptera*, Baker.—From Sierras, California.
Pteris aquilina, L.—Common brake; hardy.
" *aquilina*, var. *lanuginosa*, Hook.—From Oregon. (Exhibited for the first time.)
Lomaria Spicant, Desv.—From Oregon; hardy; evergreen.
Woodwardia Virginica, Smith.—Mass.; hardy.
" *angustifolia*, Smith.—Mass; not common; hardy.
Scolopendrium vulgare, Smith.—From Owen Sound, Canada; hardy; evergreen.
Camptosorus rhizophyllus, Link.—From Vermont; hardy; evergreen.
Asplenium Trichomanes, L.—Mass.; hardy; evergreen.
" *ebeneum*, Aiton. " " "
" *thelypteroides*, M.—Not common; hardy.
" *Filix-fœmina*, Bernh.—Mass.; common; hardy.
Phegopteris polypodioides, Fée.—Essex Co., Mass.; hardy.
" *hexagonoptera*, Fée—Medford, Mass.; not common; hardy.
" *Dryopteris*, Fée—Berkshire Co., Mass.; not common; hardy.
Aspidium acrostichoides, Swz.—Mass.; hardy; evergreen.
" *aculeatum*, var. *Braunii*, Döll.—Vermont; hardy.
" *Thelypteris*, Swz.—Mass.; common; hardy.
" *Noveboracense*, Swz.—Mass. " "
" *patens*, Swz.—From Texas.
" *fragrans*, Swz.—From Vermont.
" *spinulosum*, Swz.—Newton, Mass.; hardy.
" " var. *intermedium*. " "
" " " *dilatatum*, Gray.—Mass.; hardy.
" " " *Boottii*, " " "
" *cristatum*, Swz.—Mass.; hardy.
" " var. *Clintonianum*.—Berkshire Co., Mass.; hardy.
" *Goldianum*, Hook.—From Vermont; hardy.
" *Filix-mas*, Swz.—From Owen Sound, Canada; hardy.
" *marginale*, Swz.—Mass.; hardy; evergreen.
Struthiopteris Germanica, Willd.—Mass.; hardy; not common.

Onoclea sensibilis, L.—Mass.; hardy.
Cystopteris fragilis, Bernh.—Mass.; hardy.
" *bulbifera*, Bernh.—Syracuse, N. Y.; hardy.
Woodsia Ilvensis, R. Br.—Mass.; hardy.
" *obtusa* Low.—Mass.; hardy.
Dicksonia punctilobula, Kze.—Mass.; hardy.
Osmunda regalis, L.—Mass.; hardy.
" *Claytoniana*, L.—Mass.; hardy.
" *cinnamomea*, L. " "
Botrychium ternatum, Swz.—From California; hardy.
" *Virginicum*, Swz.—Mass.; hardy.
Adiantum pedatum, L.—Mass.; hardy.
" *Capillus-Veneris*, L.—From Utah.

This exhibit was the result of my first season's cultivation of ferns, the specimens having been all grown in my garden, under the disadvantage of an unusually dry summer. Though by no means so large or fine as I hope to show another season, they have strengthened my convictions that our native ferns may be readily cultivated and become permanent objects of beauty in our gardens."

GLADIOLI, as in seasons past, have been a very prominent feature of the exhibitions. J. S. Richards and George Craft have contributed most frequently, and W. H. Spooner has sent some fine English and French varieties. The prize day was August 19th, when J. S. Richards, J. B. Moore, George Craft, A. McLaren, and Herbert Gleason, exhibited very fine stands of flowers. At the annual exhibition, George Craft and A. McLaren exhibited fine stands of almost every shade and color, and J. S. Richards a stand of his fine seedlings.

ASTERS.—Unusually good collections were shown by C. M. Atkinson, J. B. Moore, J. A. Black, James Nugent and Hovey & Co. The competition was unusually active, and the flowers, both as to size and variety, were the best we have seen.

LILIES.—September 2, being prize day, W. H. Spooner, made a very fine display of *Lilium lancifolium*, *L. macranthum*, *L. punctatum*, *L. album*, *L. rubrum*, and *L. monstrosum*. From Hovey & Co. came lilies Melpomene, Thalia, and Clio. From C. M. Atkinson, three very fine pots of *Lilium longiflorum*. From C. A. Putnam, *L. Washingtonianum*. From B. K. Bliss, *L. avenaceum*, *L. cordifolium*, *L. Krameri*, and *L. Hansonii*. From N. Hallock, *L. Leichtlinii* and *L. tigrinum fl. pl.* From Francis Putnam, *L. au-*

ratum, and from James Comley, a very fine stand of *L. Canadense*.

The Committee have awarded the Prospective Prize to Francis Parkman for his Seedling Lily, to which the name of *Lilium Parkmanni*, has been given in England. It first bloomed in 1869, and has been shown nearly every year since. Last year it was exhibited on the 5th of August. In England it has been pronounced the best lily ever raised. Four, if not more, engravings of it have been printed, and it has excited a discussion in the journals and magazines which still continues. No flower raised in this country has ever created such a sensation abroad. We copy the following account, by the originator, from the "Gardener's Chronicle:"

"It is a hybrid between *Lilium auratum*, and a deep colored variety of *L. speciosum*. The latter was the female parent. Impregnation took place readily, and the young bulbs were planted in the open ground for the first time in the spring of 1869. There were about fifty of them. Several, as they grew, showed the peculiar spotted stem of the male parent, but when they set flower buds, as nearly all of them did in the same season, the features of *L. auratum* could be distinguished in only one of them. The rest, in bud and flower, appeared to be merely *L. speciosum*, quite unaffected by the pollen of the male parent.

The one case alluded to was a remarkable exception. The flower opened ten days earlier than any of the rest; its color was a deep red; it had the fragrance of *L. auratum* and resembled it also in form. This first flower measured nine and a half inches from tip to tip of the petals. In the following year there were several flowers, of which the largest measured eleven and a half inches. The bulb was then in a pot; as no special pains or skill was applied to its cultivation, the flower might doubtless be grown to the diameter of a foot.

This hybrid was the result of a great number of experiments in the cross fertilization of lilies."

Messrs. Hovey & Co. have also raised a new hybrid lily, which they have offered for the Society's Prospective Prize. The following description of it is by C. M. Hovey:

"*Lilium speciosum Hoveyi*, is a seedling from *L. Melpomene*, fertilized with *L. auratum*. It was the first hybrid raised between these two varieties, immediately after the latter was first exhibited. It bloomed magnificently, and the plant, with twelve fully expanded flowers was exhibited before the Society in 1866, but owing to an

unfortunate accident, the bulb was nearly lost, and has not bloomed until recently, and has not again been exhibited until this year, when flowers from young bulbs were shown in July.

It is a fine acquisition, and in its whole character shows the influence of each parent, and the valuable results to be obtained by hybridization. The flowers are very nearly of the form of *L. speciosum*, and the colors similar, only more clear, better defined, and deeper, as well as more brilliant. The foliage is also the same. In the size of the flowers, however, it takes after *L. auratum*, even excelling that large flower, being nearly or quite fourteen inches in diameter in full sized blossoms, the bud measuring exactly seven inches long just before opening; the petals are three inches in breadth. It also flowers about the same season, or a week or two earlier than *L. speciosum*.

Its remarkable qualities, aside from the size of its immense blossoms, are the clearness of its pure white petals, without any intermixture of green, and the deep, rich, brilliant color of the broad carmine band which runs through the centre of each, intensified by conspicuous large, bold, crimson spots, and still darker blood-colored papillæ, with which they are thickly studded at the base. The petals are also flat (not twisted), and reflex with an evenness and beauty rarely seen among the reflexed lilies. It is a remarkably robust grower, attaining the height of from six to seven feet, with a stem an inch in diameter. The plant produces from twelve to twenty flowers."

Verbenas.—The show was unusually large, there being seven contributors, and the varieties were much better than usual. E. C. Smith and J. O'Brien were the successful competitors.

Native Plants have been shown by Mrs. C. N. S. Horner, E. H. Hitchings, and G. E. Davenport. This department is always very interesting and the contributors have been indefatigable in their labors to do their part well, Mrs. Horner's displays having been the largest. The plants have been neatly and correctly named, which made them a very interesting feature of the exhibitions. We notice as worthy of mention from Mr. Davenport, —

Arabis sp.
Cassandra calyculata.
Castilleia coccinea (Painted Cup).
Claytonia Virginica (Spring Beauty). From Illinois.
Collinsia verna.

Dicentra Cucullaria (Dutchman's Breeches).

Eriostemon angustifolium.

Hepatica triloba, a plant in a pot, showing the flowers transformed into leaves.

Hottonia inflata (Water Violet), a very fine specimen.

Hydrophyllum appendiculatum. From Illinois.

" *macrophyllum.* " "

Mertensia Virginica (Virginian Cowslip or Lungwort).

Pyxidanthera barbulata. From the pine woods of New Jersey.

Trillium erectum (Purple Trillium, Birthroot).

" *grandiflorum* (Large White Trillium).

" *nivale* (Dwarf White Trillium).

" *sessile.*

Uvularia grandiflora (Large Flowered Bellwort).

Viola rotundifolia.

Zanthoriza apiifolia (Shrub Yellow-root), from Concord, Mass.

July 22d, E. H. Hitchings exhibited a very interesting specimen of the *Nymphæa odorata* (Water Lily), showing the roots, leaves, and flowers, both in the undeveloped and perfect state. Also, *Utricularia gibba* (rare), *Eriocaulon septangulare*, *Epidendrum conopseum*, from Florida; *Habenaria blephariglottis*, *H. psychodes*, *Cuscuta Gronovii*, and other choice varieties.

Double Zinnias.—September 9th being prize day, very fine stands were shown by George Craft, James Nugent, and others. It is gratifying to see this useful annual coming into general cultivation. With its numerous varieties, of almost every shade of color and lasting so long in perfection, no garden can well afford to be without it.

Cut Flowers.—For the prizes for fifty named varieties of greenhouse flowers, Hovey & Co., C. M. Atkinson, and James McTear, have been the competitors; of the fifty named Annuals and Perennials, Hovey & Co. have been the only contributors. We must repeat what we stated in our last report—that the competition for these prizes has not met the expectations of the Committee. It was hoped that the premiums offered for named varieties of flowers would incite a spirited competition, and that the collections offered would form a very instructive feature of the exhibitions, but so far they have been a failure.

Cut Flowers (150 bottles). W. K. Wood and James Comley, have contributed regularly to the weekly exhibitions, very handsome

stands of choice flowers. Hovey & Co. and Mrs. E. M. Gill have been the next largest contributors, and J. B. Moore and J. O'Brien have sent occasional contributions. Owing to the dryness of the season, the competition was probably less than it otherwise would have been, but those who have contributed have done their part well, and, as in all past seasons, have added very much to the appearance of the Hall. At the Annual Exhibition, the display was unusually good, and the stands were kept up with choice flowers through the exhibition very much better than usual. The contributors were W. K. Wood, Hovey & Co., Mrs. E. M. Gill, W. C. Strong, J. O'Brien, James Nugent, and A. H. Dunlap.

Greenhouse Plants.—April 8th, C. M. Atkinson, and E. S. Rand, Jr. each exhibited six well grown plants in fine healthy condition.

June 28th, H. H. Hunnewell exhibited six fine greenhouse Flowering plants, viz.: *Azalea decora*, *A. Gledstanesii*, *Rhynchospermum jasminoides*, *Fuchsia Avalanche*, *Anthurium Scherzerianum* and *Trichinium Manglesii*. These were all well grown handsome specimens.

E. S. Rand, Jr., exhibited *Allamanda Schottii*, *Cattleya Mossiæ*, *Dendrobium albo sanguineum*, *Saccolabium retusum*, *Vinca rosea*, and *V. alba*.

At the Annual Exhibition, F. L. Ames, Hovey & Co., and William Gray, Jr., exhibited very fine collections of plants. At no time has the Hall been graced with a collection superior to that of F. L. Ames; every plant was a clean, handsome specimen. The species were as follows, —

Kentia Forsteriana, a new species of palm, introduced by M. Linden, from Lord Howe Island, which lies between New South Wales and New Zealand.

Areca rubra, a very graceful species, having light and feathery foliage; dark green color. It is suitable for table decorations, and is one of the best for general stove purposes.

Areca lutescens, a fine palm for table decoration, being small and dwarf; fronds graceful; pale green. This species ought to be in every collection.

Cocos Weddelliana, the most elegant species of this genus, with gracefully spreading fronds. When not more than four feet high, young plants of it have often as many as twelve and twenty fronds, forming a plume of the most beautiful description.

Geonoma Schottiana.—Fronds from two to four feet long, drooping, slender. A truly elegant palm, of light feathery appearance, not to be surpassed for decorative purposes.

Dracæna amabilis.

Pandanus Veitchii.

Beaucarnea recurvata.—A native of Mexico; trunk reaching a height of five to six feet, two to three inches thick; leaves, one hundred or more in a very dense rosette, recurved from the very base, three to five feet long, three-fourths of an inch to an inch broad above the deltoid base.

Croton maximum.—The largest of the yellow leaved varieties; of strong robust habit; leaves of a rich golden color, marked on each side of the midrib with dark olive green bands of irregular form.

Sphærogyne latifolia.

Curculigo recurvata variegata.

Hovey & Co. exhibited the following:

Areca speciosa.

Chamærops excelsa.

Pritchardia Pacifica, with magnificent, large, fan like leaves.

Seaforthia robusta.

Phormium atropurpureum, a very distinct kind, of the habit of *P. tenax*, but with leaves of a beautiful reddish purple.

Phormium Veitchii var.—A highly ornamental and noble plant for the garden or conservatory.

Croton irregulare.—Very handsome, having long narrow leaves, which are dark green, with a light red midrib; highly decorative.

Dracæna Youngii, a bold, robust, spreading kind; very fine.

Pandanus ornatus, with superb, long, green leaves.

Yucca quadricolor, with fine, narrow, drooping foliage; green ground, striped with yellow and crimson.

Paullinia thalictrifolia, a lovely, half climbing plant, of slender growth, producing very freely its beautifully cut leaves, which resemble the fronds of a Maiden Hair fern.

Hovey & Co. have for many years been contributors to the exhibitions, but at no time have they shown a collection better than that just named.

Specimen Plants.—June 22d, H. H. Hunnewell exhibited a splendid plant of *Pandanus Veitchii*, one of the most beautiful plants introduced by the Messrs. Veitch; the leaves are light green,

beautifully striped with broad bands and lines of pure white, and are gracefully recurved. It is a superior plant for exhibition or decorative purposes.

At the Annual Exhibition Hovey & Co. exhibited a splendid specimen of *Pandanus reflexus*, a fine stove evergreen plant. William Gray, Jr., showed a very fine specimen of *Platycerium grande*. "This fine fern should be grown on a large block, upon which it forms a beautiful coronet. The sterile fronds or shields are erect and permanent, alternately overlapping each other, rounded on the lower edge, the upper part much divided or forked. The fertile fronds rise from the sinus of the sterile ones, are coriaceous in texture, many times dichotomously forked, and densely clothed with white, stellate scales; they measure from one to three feet in length, and the sori form a dense, irregular patch near the sinus of the first division. It requires a stove temperature. It is a native of the Malay Islands, and of various parts of Australia." "The Garden," Vol. III, p. 275, where it is also figured.

Specimen Flowering Plants.—Hovey & Co. exhibited *Lapageria alba*, and *Allamanda Schottii*, and William Gray, Jr., *Cypripedium Roezlii*. The last named is a native of New Grenada; the sepals of the flower are of a delicate pink color, streaked with red, the greenish, attenuated petals being margined with bright pink or red; the lip is of a clear greenish yellow tint; the leaves are glossy bright green. We believe it is the first time it has been exhibited.

Variegated Leaved Plants were shown by Hovey & Co. and William Gray, Jr., and although there was nothing new in either collection, the plants were well grown specimens of good standard species and varieties.

Specimen Variegated Leaved Plants.—William Gray, Jr., exhibited a fine plant of *Phormium Colensoi*, and J. B. Moore, a fine plant of *Croton interruptum*.

Caladiums were shown by C. M. Atkinson, Hovey & Co., J. B. Moore, and W. T. Andrews. The plants were not as large as some that have been shown in former years, but the foliage was particularly fine, and some of the varieties were very showy, and highly ornamental. The very fine collection from W. T. Andrews was a great attraction; the following named varieties were very striking:

Barillet.	Dr. Lindley.
De Humboldt.	Duc de Morny.

Flora.	Mrs. Dombrain.
Gaerti.	Princess of Teck.
Impératrice Eugénie.	Quadricolor.
Laingii.	Triomphe de l' Exposition.
Lepeschkinei.	Vesta.

FERNS were exhibited by F. L. Ames, Hovey & Co., and J. Warren Merrill. Those exhibited by Mr. Ames were the handsomest plants ever shown, and comprised the following fine varieties:

Adiantum amabile,
" *assimile*,
" *concinnum latum*,
" *cuneatum*,

a charming group, all of them well adapted for specimen culture.

Davallia Mooreana, described in the TRANSACTIONS for 1875, Part II, p. 69.

Gleichenia Dichotoma.—The *Gleichenias* constitute one of the most beautiful groups belonging to the whole family of Ferns, and for decorative and exhibition purposes are among the very best. An excellent article on the genus may be found in "The Garden," Vol. IX, p. 445.

Gleichenia speluncæ.

Gymnogramme Peruviana argyrophylla.—Silvery-grey on both surfaces; a splendid fern.

Platycerium alcicorne majus.—The habit of this fern is so curious, that it is almost indispensable in every collection.

From Hovey & Co. came

Adiantum trapeziforme,	*Davallia Tyermanni*,
Alsophila australis,	*Hypolepis distans*,
" *Van Geerti*,	*Lomaria gibba*,
Asplenium Fabianum,	*Pteris scaberula*,
Davallia Mooreana,	

which were well grown specimen plants.

SIX NAMED NEW VARIETIES were shown by J. Warren Merrill. They were *Anemia adiantifolia*, *Cheilanthes Clevelandii*, *C. Alabamensis*, *Aleuritopteris tricolor* (?), *Dictyogramme Japonica variegata*, *Gleichenia circinata glauca*.

ADIANTUMS.—Hovey & Co., were the only exhibitors, with *A. Farleyense*, *A. cuneatum*, *A. trapeziforme*, *A. decorum*, *A. concinnum* and *A. concinnum latum*, six fine ferns.

TREE FERNS.—Very fine specimens were shown by J. Warren Merrill and Hovey & Co.

March 25th, J. Warren Merrill exhibited a fine plant of *Athyrium Goringianum pictum*, a greenhouse fern from Japan, of very easy culture, and said to be well adapted for ferneries, rooms, or table ornaments. June 3d, William Gray, Jr., exhibited *Polypodium (Niphobolus) lingua corymbifera*, a very rare fern from Japan.

At the Annual Exhibition, E. H. Hitchings showed the following named rare forms of *Botrychium ternatum:*

No. 1. "With the two lateral primary divisions of the sterile frond changed into long-stalked fertile fronds." See "Gray's Manual."

No. 2. With three fertile fronds on the stem of the sterile frond.

No. 3. With two sterile, and two fertile fronds on the same stem.

Nos. 4 and 5. With sterile fronds, each bearing on its stem two fertile fronds.

No. 6. With double fertile frond.

DRACÆNAS were exhibited by Hovey & Co. The plants were of medium size, well grown, and in good order. The varieties were *Youngii*, *Shepherdii*, *amabilis*, *imperialis*, *Regina* and *stricta*.

PALMS.—A very fine pair were shown by William Gray, Jr.—*Livistonia Borbonica* and *Chamædorea elegantissima*. Hovey & Co. also exhibited a pair.

AGAVES.—Two good collections were shown by E. S. Rand, Jr., who brought *A. coccinea*, *A. micracantha*, *A. Xalapensis*, *A. striata*, *A. Antillarum* and *A. Verschaffelti*, and Hovey & Co., who exhibited *A. medio picta*, *A. cyanea*, *A. Nissonii*, *A. applanata*, *A. heteracantha cærulea*, and *A. Bessereriana candida*. Of late years, considerable attention has been given to this fine class of ornamental plants, which, for outside decoration, either in tubs or plunged in beds, have scarcely an equal, and are quite as well adapted for conservatories and halls.

CACTI.—A very interesting collection was shown by John C. Hovey, which were neatly and correctly labelled, and added much to the interest of the exhibition. In the collection we noticed the following species and varieties not mentioned in our last report:

Cereus Jamaicensis.
Echinopsis Schethasii.
Mammillaria bicolor.
" sp. No. 1, New Mexico.
Opuntia fragilis.
Opuntia hystrix.
" *macrodasys minima.*
" *speciosa.*
" *tenuispina.*

Succulents (other than Agaves and Cacti). The only exhibitor was John C. Hovey, whose specimens were selected with much care, and contained the following species and varieties not mentioned in our last report:

Aloe albocincta.	*Haworthia coarctata.*
" *humilis.*	*Hechtea Ghiesbreghtii.*
" *rhodacantha.*	*Littœa juncifolia.*
Crassula perposa.	*Mesembryanthemum echinatum.*
Gasteria Bowieana.	*Rhipidodendron plicatile.*
" *maculata.*	*Sempervivum dodrantale.*

Best new Pot Plant.—F. L. Ames, exhibited *Cypripedium Sedeni.*

Celosia Pyramidalis.—Four good plants were shown by C. M. Atkinson. In Europe these are largely grown in pots for exhibition, and also for table decoration; they grow freely in the open ground and are highly ornamental for borders, and very showy when arranged with other plants.

Dahlias.—S. G. Stone and C. M. Atkinson have been the only contributors; the display has been less than in previous seasons.

Bouquets.—Hovey & Co., James Nugent, Mrs. E. M. Gill, Mrs. S. Joyce and James O'Brien have been the contributors. The Hand Bouquets have been very good—indeed, they have been first class all through the season, while on the other hand, the Parlor Bouquets have been very poor. We hope another season to see a great improvement in the latter.

Baskets of Flowers.—Hovey & Co., Mrs. A. D. Wood, Mrs. S. Joyce and Mrs. E. M. Gill, have been the principal contributors. As in past seasons, baskets have been quite a feature of the weekly exhibitions, and the efforts of the contributors seem to be appreciated by all.

Table Designs have been shown by Hovey & Co., Mrs. A. D. Wood, Mrs. S. Joyce and Mrs. E. M. Gill. There has been much sameness in the designs, and the Committee think that there is room for improvement in this direction, and hope another season will witness it.

Rustic Stands.—Two very fine stands, arranged in good taste with choice plants, were shown by Hovey & Co. and W. J. Vass.

Evergreen Trees and Shrubs, were shown by W. C. Strong and J. W. Manning. The collection shown by Mr. Strong contained fifty varieties of Coniferous Evergreens, most noticeable

among which were *Retinispora pisifera aurea*, six feet high—a fine specimen of uncommonly bright color; *R. obtusa aurea*, a dwarf compact variety, also very golden; several other *Retinisporas* of merit; some fine new Spruces and *Piceas*, noticeable among which was *P. Nordmanniana;* also *Thujas* in variety, among which *T. occidentalis variegata* was most conspicuous.

CHRYSANTHEMUMS.—The exhibition was a decided success. At no time have such good plants been shown as on this occasion; the specimens were full of vigor and health, and finely clothed with flowers. The value of this flower for autumn decoration, yielding as it does, a supply of flowers, when so many other things are failing, cannot be over estimated.

NEW AND RARE, OR FINE SPECIMEN PLANTS.—William Gray, Jr., brought a small plant of *Cypripedium niveum* (Snow-white Lady's Slipper). H. Noel Humphreys says, in "The Garden," Vol. IX, p. 525, "This is a little gem, and a general favorite wherever it is grown. In habit it is so nearly like *C. concolor* that Mr. Ellis, who obtained many of the first plants introduced, mistook it for *C. concolor* until it flowered. The foliage is, however, a little longer, and rather deeper in color; the flowers are borne on one or two flowered scapes, which vary from three to six inches in height, sometimes even higher; the sepals are white in front, suffused with delicate rose-flesh at the base, which gives them a charming opaline appearance, and at the back they are suffused with green and blotched with dull purple; the sepals are pure white, nearly two inches long, and are dotted at the base with purple; lip oblong, slightly pointed, not unlike a wren's egg, but larger, pure white, with minute purple dots."

Mr. Gray has also shown *Cypripedium biflorum*, a handsome species from India, in the way of *C. barbatum*, but with more variegated foliage. The blossoms are produced on a spike; sometimes two flowers appear on one stem; the top petal is very handsome, the upper part being of a beautiful white, the other part of the flower purplish brown. It will keep for weeks in good condition.

James Comley has shown,

Allamanda Weddelliana.—New and the first time exhibited.

Anthurium crystallinum, a very rich ornamental plant; leaves of a rich, dark green color, the midrib and principal veins being bordered on each side with a beautiful bright silvery white band. The

young leaves are of a rich bronzy shade, forming an effective contrast with the more mature foliage.

Anthurium Scherzerianum, a very striking and attractive plant, producing beautiful scarlet floral spathes, each of which remains a long time fresh and brilliant.

Bougainvillea glabra, a fine plant.

Dracæna metallica.—This is considered one of the finest of the dark leaved *Dracænas*, and is among the very best of decorative plants. New, and now first shown.

Eriostemon buxifolium.—A very handsome New Holland shrub.

Fragaria variegata.

Hedychium flavum.

Hibiscus Rosa-sinensis cruentus, a remarkably fine and showy stove plant; flowers of moderate size, compact and double; of a very rich crimson red.

Hydrangea Otaksa, a Japan species, very double; with pink flowers and blossoms in clusters. The plant exhibited was a very fine specimen with thirty-seven full heads of bloom.

Hydrangea stellata fl. pl.

Lapageria alba.

Rhododendron Aucklandi.—This is exceedingly rare, and one of the handsomest of the Himalayan series; its fine large white flowers are sometimes from four to six inches in diameter. New, and now first exhibited.

R. formosum grandiflorum, a free blooming variety, with finely formed, pure white flowers. A neat growing kind, and very useful for conservatory decoration.

R. Princess Alice.—A neat, dwarf, bushy growing variety, of the *ciliatum* type, with comparatively small leaves, and producing clusters of deliciously scented bell-shaped white flowers, flushed with pink on the outer surface.

R. Princess Royal.—A handsome and distinct variety, of neat compact growth, with clusters of richly shaded rose colored, funnel shaped flower tubes.

Sempervivum arboreum variegatum.

Edward S. Rand, Jr., has shown,

Aloe elegans tenuoir.

Aphelandra Fascinator, a fine species with very ornamental foliage as well as magnificent flowers; the leaves are rich dark green beautifully banded with silvery white, and underneath of uniform

; the spikes of bloom are very large and of a dazzling

niveum.

Japonicum (new).

suaveolens, a beautiful white flowering sweet scented

lbocodium.

ata.

chanani.

Harrisi and *T. laurifolia*, two beautiful stove ever-

son has shown,

Scherzerianum, a very handsome plant.

rvilliæ or *Phaius grandifolius*, a very fine plant with
f flowers and at least two hundred and fifty blooms.

scipula (Venus' Fly-trap), a very interesting plant,
ecimen ever shown. A very excellent article on the
e found in the "Gardener's Monthly," Vol. X,

alycina major, a very handsome stove evergreen

n Mrs. Shuttleworth, also very fine.

Drummondi, a very fine plant indeed. This is an
nnial from Florida, the leaves or pitchers of which
t, and from a foot to two and a half feet high; they
green color, and at the upper expanded end are varie-
ulated form with white, red, and green, the hood, or
uch undulated, being similarly marked; the flower
le.

lava, an attractive species, also from Florida, with
bout two feet high, and having at the apex a large
ith a broad lid of a uniform bright green color. One

ariolaris, a free growing erect plant, though not so
me others, but worthy of a place in every collection.
of an apple green tint.

plants were exceedingly interesting and attracted

spectabilis.

us rutilans, a very handsome plant, in fine bloom.

From Hovey & Co.,

Aloe saponaria, in bloom.

Bougainvillea spectabilis, a splendid conservatory climber.

Clematis azurea grandiflora.

" *florida fl. pl.*

" *Lord Londesborough.*

" *Sophia fl. pl.*

" *Stella.*

" *Veitchii.*

Epiphyllum Hoveyi, a fine seedling variety.

Monstrosa deliciosa, flower and leaf.

Ornithogalum thyrsoides alba, a fine species, very ornamental. The flowers are white, and appear in spikes from six to eight inches long.

Pelargonium Button-hole, recommended as a very desirable variety.

Rudgea macrocephala (new) with pure white flowers, and large glossy foliage.

From C. S. Sargent, a very fine plant of *Phormium tenax variegatum*, in flower. This is a finely variegated form of the well known New Zealand Flax; of erect, stately growth, and very ornamental, the fine broad leaves being ornamented with conspicuous broad stripes of creamy white, running their whole length, and contrasting well with the light, shining green, ground color. It is a noble plant, and well adapted for decorative purposes. This was the first time that it had been shown in flower. A small mat, made by the native Maoris of New Zealand from the fibre of this plant, was sent in by Miss H. E. Stevenson and exhibited at the meeting of the Society, showing the character of the fibre. Mr. Sargent also exhibited *Proteinophallus Rivieri*, a finely grown specimen of a curious Aroid, of very striking appearance.

From A. S. Lewis, a very fine seedling Primula,—flowers double white; large and fine; in size quite equal to a large double daisy; fine stalk, well above the foliage. It would be very valuable as a florist's flower.

From J. H. Woodford, *Veltheimia viridifolia*, a bulbous greenhouse plant from the Cape of Good Hope. Also, the following fine Clematis:

Miss Bateman.—White, with chocolate-red anthers.

Lord Londesborough.—Rich mauve, with maroon stripes.

r.—Deep lavender, with pale bar.
Veitch.—Light blue; flowers large and double.
ale lavender.
h Clark, some magnificent flowers of Clematis *Lucie*
ble white; rosette formed; very fine: *John Gould*
ryi, pure white or creamy white; very fine indeed.
eld Fuller, *Guzmannia picta*, a pretty species.
on Dawson, *Calypso borealis*, a small but extremely
nd deserving a place in every garden. Also, *Xiphion*
um, and *Fressia* (*Tritonia*) *Leichtliniana*.
o O. Ross, *Cereus roseus grandiflorus*.
Rogers, a very fine specimen plant of *Rhynchosper-*
ides.
erkins Institution for the Blind, a fine spike of flowers
abile.
cLaren, a good plant of *Tabernæmontana coronaria*

el Duffy, a very fine display of *Amaryllis Belladonna*.
cLaren, A. P. Calder, and J. G. Barker, magnificent
om of *Hydrangea paniculata grandiflora*, one of the
ardy shrubs.
cTear, *Campanula isophylla*.
. Merriam, *Lapageria alba*.
Andrews, *Zephyranthes candida*, a very pretty, white-
ous plant.
cis Parkman, *Pyrus malus baccata fl. pl.*, from Japan,
riety with delicate pink flowers; new and rare; also,
matis, and a magnificent display of Aquilegias, the
l varieties ever shown.
ion, we call special attention to the new rule of the
ittee, No. 5, and to the change in the exhibitions for
nths of the year, from the second to the first Saturday
; also, to the fact that all who wish to compete for
s must apply to the Superintendent for the boxes, on or
st. We hope all the exhibitors will give the SCHEDULE
eful attention, and we again remind them that if they
of the plants and flowers exhibited, they must not
d a list of the same to the Committee.

For the Committee.

JOHN G. BARKER, Chairman.

PRIZES AND GRATUITIES AWARDED FOR PLANTS AND FLOWERS.

January 1.

Gratuities: —

To James O'Brien, for Cyclamen,	$1 00
James Comley, for *Amaryllis Hendersoni*,	1 00
Miss S. W. Story, for Cut Flowers,	1 00
James Comley, " " "	2 00
John B. Moore, " " "	2 00
Mrs. C. N. S. Horner, for Native Flowers,	2 00
W. E. Endicott, for *Urceolina pendula*,	1 00
A. S. Lewis, for Seedling Primula,	2 00
Mrs. S. Joyce, for Dish of Flowers,	1 00
Mrs. E. M. Gill, for Cut Flowers and Plant,	2 00
E. S. Rand, Jr., " rare Orchids,	8 00
" " " " *Thunbergia Harrisi*,	1 00

January 8.

Gratuities: —

To Mrs. A. D. Wood, for Cut Flowers,	2 00
John B. Moore, " " "	2 00
Mrs. S. Joyce, " " "	2 00
James Comley, " " "	2 00
Miss S. W. Story, " " "	1 00
Mrs. E. M. Gill, " " "	2 00
John B. Moore, for Amaryllis sp.,	2 00
Twombly & Sons, for Rose Buds,	1 00
L. H. Foster, " " "	1 00
E. S. Rand, Jr., " Orchids,	2 00

January 15.

Gratuities: —

To James Comley, for *Lycaste Skinneri*,	2 00
E. S. Rand, Jr., for *Aphelandra Fascinator*,	2 00

. Story,	for Cut Flowers,		$1 00
Tear;	" " "		2 00
mley,	" " "		3 00
. Wood,	" " "		2 00
Ioore,	" " "		2 00
"	" Amaryllis Cleopatra,		2 00
I. Gill,	" Basket of Flowers,		2 00
oyce,	" " "		2 00
ter,	for Rose Buds,		1 00

JANUARY 22.

s:—

Moore,	for specimen Azalea,		3 00
nley,	" Azalea,		1 00
"	" Lily of the Valley,		2 00
"	" choice Cut Flowers,		3 00
I. Gill,	" Cut Flowers,		2 00
Ioore,	" " "		2 00
Tear,	" " "		2 00
Wood,	" " "		2 00
oyce,	" " "		2 00
"	" *Amaryllis fulgida*,		1 00
ıtnam,	" " Seedlings,		1 00
ith,	" Carnations,		1 00
d, Jr.,	" Orchids,		5 00

JANUARY 29.

s:—

odford,	for *Veltheimia viridiflora*,		1 00
nley,	" Stand of Cut Flowers,		3 00
der,	" Lily of the Valley,		3 00
ith,	" Carnations,		1 00
I. Gill,	for Cut Flowers,		1 00
nley,	" " "		2 00
Tear,	" " "		2 00
. Wood,	" " "		2 00
. Story,	" " "		1 00
oyce,	" " "		2 00
Ioore,	" " "		3 00
nley,	" *Cymbidium aloifolium*,		2 00

To E. S. Rand, Jr., for *Cattleya amethystoglossa*,		$5 00
J. F. Rogers,	" *Dendrobium nobile*,	1 00
C. M. Atkinson,	" Plant and Violets,	2 00

FEBRUARY 5.

Gratuities :—

To A. P. Calder, for Forced Lilacs,		1 00
B. G. Smith, for Carnations,		1 00
Mrs. E. M. Gill, for Cut Flowers,		1 00
Mrs. S. Joyce,	" " "	1 00
Miss S. W. Story,	" " "	1 00
John B. Moore,	" " "	2 00
James Comley,	" " "	2 00
John B. Moore,	" Amaryllis Bayard,	1 00
Francis Putnam,	" Seedling Amaryllis,	1 00
Jackson Dawson,	" Choice Flowers,	2 00

FEBRUARY 12.

CYCLAMENS.—For the best six, in pots, to C. B. Gardiner,		6 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to James O'Brien,		5 00
For the second best, to Mrs. S. Joyce,		4 00

Gratuities :—

To E. S. Rand, Jr., for Orchids,		7 00
C. T. Hubbard,	" "	1 00
Hovey & Co.,	" Plants,	2 00
James Comley,	" "	3 00
John F. Rogers,	" "	8 00
Marshall P. Wilder, for Azaleas,		2 00
John B. Moore, for Amaryllis Aurora,		1 00
James Cartwright, for *Cœlogyne cristata*,		1 00
James Comley, for Cut Flowers,		4 00
Miss S. W. Story,	" "	1 00
Hovey & Co.,	" "	1 00
B. G. Smith,	" "	1 00
L. H. Foster, for Roses,		1 00
C. B. Gardiner, for Cyclamen,		1 00
James O'Brien,	" "	1 00
Francis Putnam,	" Amaryllis,	2 00
Mrs. A. D. Wood, for Vase of Flowers,		1 00

FEBRUARY 19.

:—

tnam, for Amaryllis,		$2 00
. Gill, " "		1 00
oore, " " Regina,		1 00
" " specimen Azalea,		3 00
yce, " Basket of Flowers,		2 00
oore, " Cut Flowers,		1 00
. Wood, " "		2 00
h, " "		1 00
. Gill, " "		1 00
ley, for Plants,		3 00
" " Hybrid Perpetual Roses,		4 00
, Jr., for *Phalænopsis Schilleriana*,		2 00
ien, " Cyclamen,		1 00
nson, " Hyacinths,		3 00
" Pansies,		1 00

FEBRUARY 26.

:—

l, Jr., for *Odontoglossum pulchellum*,	2 00
oore, for Cut Flowers of Azaleas—twenty-	
ce varieties,	3 00
. Story, for Cut Flowers,	1 00
yce, " " "	2 00
. Gill, " " "	2 00
. Wood, " " "	2 00
ley, for Cut Flowers,	4 00
tnam, for Amaryllis,	2 00
o., " Seedling Azalea,	2 00
er, " Rose Buds,	1 00
ley, " Roses in pots,	10 00
" Hyacinths,	1 00
" *Erica Cavendishiana*,	2 00
pper, " Cineraria,	1 00

MARCH 4.

:—

ley, for choice Hybrid Perpetual Roses—	
wers,	4 00

To C. M. Atkinson, for Hyacinths, ... $2 00
C. B. Gardiner, for specimen Cyclamen, . . . 4 00
Mrs. C. N. S. Horner, for Native Plants, . . . 1 00
James Comley, for Plants, ... 2 00
James Cartwright, for *Lycaste Skinneri*, . . . 2 00
John B. Moore, for specimen Azalea, . . . 2 00
Marshall P. Wilder, for new Azaleas, . . . 3 00
E. S. Rand, Jr., for Cherokee Rose, ... 1 00
Hovey & Co., for *Azalea ovata*, ... 1 00
C. M. Atkinson, for *Bletia Tankervilliæ*, . . . 5 00
Francis Putnam, " Seedling Amaryllis, . . . 1 00
J. B. Moore, " Cut Flowers and Amaryllis, . 3 00
Mrs. E. M. Gill, " " " 2 00
Mrs. A. D. Wood, " " " 1 00
Mrs. S. Joyce, " " " 2 00
Miss S. W. Story, " " " 2 00
James Comley, " " " 3 00

March 11.

Camellias.—For the best display of named varieties, Cut Flowers, not less than twenty blooms, to C. M. Atkinson, ... 6 00
For the second best, to Hovey & Co., . . . 5 00
Orchids — Winter Blooming. — For the best three varieties, to E. S. Rand, Jr., ... 10 00
For the second best, to E. S. Rand, Jr., . . 8 00
Parlor Bouquets.—For the best pair to James Nugent, 5 00

Gratuities: —

To James Comley, for Hyacinths, ... 2 00
" " " Hybrid Perpetual Rose, in pot, . 2 00
" " " Basket of Roses, ... 4 00
Francis Putnam, " Seedling Amaryllis, . . . 1 00
James Cartwright, for *Lycaste Skinneri*, . . . 3 00
Mrs. S. Joyce, " Cut Flowers, ... 2 00
E. S. Rand, Jr., " " " 2 00
James Comley, " " " 3 00
Hovey & Co., " " " 1 00
Miss S. W. Story, " " " 2 00

. Gill,	for Cut Flowers,	. . . .	$2 00
Wood,	" " "	. . . .	2 00
oore,	" " "	. . . .	3 00
"	" Azaleas,	. . . .	3 00
er,	" "	. . . .	5 00
s,	" "	. . . .	3 00
nson,	" *Thyrsacanthus rutilans*,	. .	2 00
Tobey,	" *Thunbergia Harrisi*,	. .	1 00

MARCH 18.

:—

er,	for Rose Buds,	. . . . .	1 00
	" " "	. . . . .	2 00
S. Horner,	for Native Flowers,	. .	1 00
. Wood,	" Vase of "	. . .	1 00
yce,	" Dish of "	. . .	1 00
ley,	for choice Cut Flowers,	. . .	5 00
, Jr.,	" " "	. . .	2 00
. Gill,	" " "	. . .	1 00
oore,	" " "	. . .	2 00
Story,	" " "	. . .	1 00
ley,	" Plants,	. . . . .	2 00
"	" *Anthurium crystallinum*,	. .	3 00
oore,	" specimen Azaleas,	. . . .	5 00
"	" " Hybrid Perpetual Rose,		3 00
bel,	" Pansies,	. . . . .	1 00

MARCH 25.

s:—

nley,	for Azaleas,	. . . . .	2 00
"	" Cut Flowers,	. . . .	2 00
. Gill,	" " "	. . . .	1 00
. Story,	" " "	. . . .	1 00
oyce,	" " "	. . . .	1 00
Merrill,	" rare Fern,	. . . .	2 00
Co.,	" Plants,	. . . . .	1 00
Moore,	" Hybrid Perpetual Roses—a very splay of Cut Flowers,	. . . .	2 00

To James Comley,	for	superb Basket of Roses,	$5 00
John B. Moore,	"	specimen Azaleas,	3 00
C. M. Atkinson,	"	*Trichopilia suavis*,	1 00
" "	"	specimen Pelargonium,	3 00
C. S. Sargent,	"	*Proteinophallus Rivieri*,	2 00
E. S. Rand, Jr.,	"	Cherokee Roses,	1 00
M. P. Wilder,	"	new Azaleas,	3 00

APRIL 1.

Gratuities: —

To John B. Moore,	for	Hybrid Perpetual Roses—fine Cut Flowers,	3 00
Mrs. S. Joyce,	for	Table Design,	1 00
James Comley,	"	choice Cut Flowers,	4 00
Miss S. W. Story,	"	" " "	1 00
Mrs. E. M. Gill,	"	Cut Flowers,	1 00
Mrs. A. D. Wood,	"	Dish of Cut Flowers,	2 00
L. H. Foster,	"	Stocks,	1 00
Hovey & Co.,	"	Plants,	2 00

AZALEA EXHIBITION.

APRIL 8.

INDIAN AZALEAS.—For the best six named varieties, in pots, to Marshall P. Wilder,	$25 00
For the best six named varieties, in eight inch pots, to John B. Moore,	15 00
For the second best, to Hovey & Co.,	10 00
For the best single specimen, to John B. Moore,	10 00
GREENHOUSE PLANTS.—For the best six, in bloom, to C. M. Atkinson,	20 00
For second best, to E. S. Rand, Jr.,	15 00
CINERARIAS.—For the best six varieties, in pots, to C. M. Atkinson,	8 00
POLYANTHUS.—For the best six, in pots, to C. M. Atkinson,	5 00
SPRING FLOWERING BULBS.—For the best collection, in pots, the second prize, to Hovey & Co.,	8 00
HYACINTHS.—For the best nine, in pots, the second prize, to Hovey & Co.,	4 00

st six, in pots, the second prize to Hovey & $3 00
t three, in pots, to Hovey & Co.. . . 3 00
t two, in pots, the second prize to Hovey & 1 00
t single specimen, to Hovey & Co., . . 1 00
For the best six pots, three bulbs in a pot, to & Co., ... 5 00
t three pots, the second prize to Hovey & 3 00
the best three pots, the second prize to & Co., ... 2 00
owers.—For the best arranged, to Mrs. A. od, ... 4 00
ond best, to Mrs. S. Joyce, . . . 3 00

s:—

Davenport, for Native Flowers, . . 1 00
nley, " choice Cut Flowers. . . 4 00
" " *Aerides odoratum*, . . 3 00
" " Azaleas, ... 2 00
I. Gill, " Cut Flowers, . . . 2 00
Moore, " " " . . . 2 00
d, Jr., " " " . . . 1 00
ter, " " ." . . . 1 00
d, Jr., " Orchid, ... 2 00
ers, " collection of Plants, . . 4 00
ebel, " Pansies, ... 1 00
ith, " Amaryllis, . . . 1 00
Co., " *Bougainvillea spectabilis*, . 1 00

April 15.

s:—

d, Jr., for choice Cut Flowers, . . . 2 00
mley, " " " . . . 3 00
oyce, " " " . . . 2 00
I. Gill, " " " . . . 2 00
. Wood, " " " . . . 2 00
Moore, " Roses, " " . . . 2 00
mley, " Plants, ... 3 00

To H. Weld Fuller, for *Guzmannia picta*,	. . .	$1 00
George E. Davenport, for Native Flowers,	. .	1 00
Mrs. C. N. S. Horner, " " "	. . .	2 00
Hovey & Co., " Hyacinths,	. . .	1 00

APRIL 22.

Gratuities: —

To E. S. Rand, Jr., for rare Orchids,	. . . .	3 00
L. H. Foster, " Rose Buds,	. . . .	1 00
James Comley, " Cut Flowers,	. . . .	4 00
John B. Moore, " " "	. . . .	3 00
Mrs. A. D. Wood, " " "	. . . .	3 00
Mrs. E. M. Gill, " " "	. . . .	2 00
Mrs. S. Joyce, " Dish of "	. . . .	1 00
James Comley, " Plants,	. . . .	3 00
George E. Davenport, for Native Flowers,	. .	1 00

APRIL 29.

Gratuities: —

To James Comley, for choice Cut Flowers,	. . .	5 00
Mrs. A. D. Wood, " " "	. . .	2 00
Mrs. S. Joyce, " " "	. . .	2 00
Mrs. E. M. Gill, " " "	. . .	2 00
Miss S. W. Story, " " "	. . .	1 00
George E. Davenport, for Native Plants,	. . .	1 00
Mrs. C. N. S. Horner, " " "	. . .	1 00
James Comley, " choice "	. . .	3 00
" " " Pansies,	. . .	1 00
B. G. Smith, " "	. . .	1 00
John B. Moore, " Seedling Gloxinias,	. .	3 00
E. S. Rand, Jr., " Orchids,	. . . .	8 00

MAY 6.

Gratuities: —

To E. S. Rand, Jr., for rare Orchid,	. . . .	3 00
Norton Brothers, " Plants,	. . . .	3 00
James Comley, " "	. . . .	2 00
Mrs. E. M. Gill, " "	. . . .	1 00
Edward B. Clapp, " Pansies,	. . . .	1 00

Moore,	for Gloxinias,		$1 00
others,	" Gladiolus,		1 00
inson,	" Hyacinths,		2 00
"	" six fine pots of Pansies,		3 00
"	" *Anthurium Scherzerianum*,		5 00
venport,	" Native Plants,		1 00
d, Jr.,	" Cut Flowers,		2 00
nley,	" " "		5 00
. Gill,	" " "		2 00
Co.,	" " "		2 00
. Wood,	" " "		3 00
. Story,	" " "		2 00
yce,	" " "		2 00
Wheeler,	" " "		1 00
er,	" " "		1 00

PELARGONIUM EXHIBITION.

May 13.

s.—For the best six named Zonale varieties, riegated, to William Gray, Jr., . . . $15 00
econd best, to " " " . . . 10 00
t six named variegated Zonale varieties, to n Gray, Jr., ... 15 00
econd best, to Hovey & Co., . . . 10 00
st six named Double Zonale varieties, to & Co., ... 15 00
econd best, to James Comley, . . . 10 00
ceous Plants (Open culture).—For the best of named species and varieties, one bottle h variety, to E. S. Rand, Jr., . . . 6 00
s.—For the best six varieties, in pots, to C. kinson, ... 10 00
n.—For the best, other than a Basket of s, to Mrs. S. Joyce, ... 4 00
second best, to Mrs. E. M. Gill, . . 3 00
the best twenty-five named Flowers, to C. kinson, ... 5 00

Special Prizes for Pelargoniums.

For the best six named Zonale varieties, not variegated, to Hovey & Co.,	$25 00
For the second best, to Hovey & Co.,	15 00
For the best six Zonale varieties, variegated, to Hovey & Co.,	25 00
For the best specimen Zonale, variegated, to Hovey & Co.,	10 00

Gratuities:—

To Waldo O. Ross, for *Cereus roseus grandiflorus*,	1 00
George E. Davenport, for Native Flowers,	1 00
Mrs. C. N. S. Horner, " " "	2 00
John F. Rogers, for *Rhyncospermum jasminioides*,	5 00
James Comley, " Plants,	4 00
John F. Rogers, " "	4 00
John B. Moore, " Seedling Gloxinias,	2 00
Norton Brothers, for Gladiolus,	1 00
E. S. Rand, Jr., for choice Orchids,	2 00
J. C. Hovey, for *Narcissus bicolor*,	1 00
C. M. Atkinson, for fine plants of *Lilium longiflorum*,	3 00
Mrs. Sherman, " Pelargonium,	1 00
J. S. Richards, " Tulips,	2 00
Miss A. C. Kenrick, for Magnolias,	1 00
Joseph Clark, for Clematis,	2 00
J. F. Rogers, for Hyacinths,	1 00
William Gray, Jr., for Pelargoniums,	12 00
James Comley, for Cut Flowers,	4 00
Miss A. C. Wheeler, for Cut Flowers,	1 00
John B. Moore, " " "	2 00
Miss S. W. Story, " " "	1 00
Mrs. A. D. Wood, " " "	3 00

MAY 20.

Gratuities:—

To Miss A. C. Kenrick, for Flowering Shrubs,	1 00
Francis Parkman, for Spring Flowering Plants,	2 00
E. S. Rand, Jr., for rare Orchid,	2 00
Miss S. W. Story, for Floral Star,	2 00

G. Smith, for Pansies,	$1 00
Gray, Jr., for *Cattleya Mossiæ*,	2 00
Joyce, for stand of Cut Flowers,	2 00
C. Wheeler, for Cut Flowers,	1 00
omley, " " "	3 00
M. Gill, " " "	2 00
D. Wood, " " "	3 00
Moore, " " "	3 00
n for the Blind, for *Crinum amabile*,	1 00
Davenport, for Native Flowers,	1 00
tchings, " " "	1 00
inson, " " "	3 00

MAY 27.

es:—

N. S. Horner, for Native Flowers,	2 00
. Smith, " " "	1 00
. Davenport, " " "	1 00
L. Tallant, " " "	1 00
Moore, for Plants,	2 00
Co., " "	2 00
nd, Jr., for Spring Herbaceous Plants,	1 00
Parkman, for " " "	2 00
nd, Jr., for Orchids,	4 00
C. Wheeler, for Cut Flowers,	1 00
M. Gill, " " "	1 00
V. Story, " " "	2 00
omley, " " "	4 00
D. Wood, " " "	2 00
Joyce, " " "	2 00
mley, for Veronica Blue Gem,	2 00
Gray, Jr., for *Cypripedium biflorum*.	1 00
C. Kenrick, for Flowering Shrubs,	2 00
ith, for Pansies,	1 00
P. Weston, for Pansies,	1 00

JUNE 3.

s.—For the best six named show varieties,	
s, the second prize to J. B. Moore,	8 00

TREE PÆONIES.—For the best six named varieties, to M. P. Wilder,	$5 00
For the second best, to Hovey & Co.,	4 00
CUT FLOWERS.—For the best display, filling 150 bottles, to James Comley,	6 00
For the second best, to W. K. Wood,	5 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. A. D. Wood,	4 00
For the second best, to Mrs. S. Joyce,	3 00
PARLOR BOUQUETS.—For the best pair, to James Nugent,	4 00
For the second best, to James O'Brien,	3 00
HAND BOUQUETS.—For the best pair, to Mrs. E. M. Gill,	3 00
For the second best, to James Nugent,	2 00
HARDY SHRUBS.—For the best display, to Miss A. C. Kenrick,	5 00
Third prize, to Miss S. W. Story,	3 00
RHODODENDRONS.—For the best twelve named varieties, one truss of each, to E. S. Rand, Jr.	10 00

Hunnewell Premiums.

HARDY AZALEAS.—For the best display of named varieties, to E. S. Rand, Jr.,	20 00
For the second best, to E. Shepherd,	10 00
For the third best, to B. G. Smith,	5 00

Gratuities:—

To James Comley, for Plants,	3 00
William Gray, Jr., for rare Fern,	2 00
Francis Parkman, " very fine Aquilegias,	2 00
William Richards, " *Cornus florida*,	1 00
James Comley, " *Bouyainvillea glabra*,	4 00
John Robinson, " Seedling Aloe,	1 00
E. S. Rand, Jr., " rare Orchids,	8 00
" " " Rhododendrons,	3 00
Eddie W. Mitchell, " Native Flowers,	1 00
Mrs. C. N. S. Horner, for Fernery,	1 00
Marshall P. Wilder, for Pæonies,	5 00
James Cruickshanks, for Cut Flowers,	1 00
John B. Moore, " " "	1 00
James Nugent, " " "	2 00
Miss A. C. Wheeler, " " "	1 00
Mrs. E. M. Gill, " " "	2 00

JUNE 10.

Hunnewell Premiums.

ODENDRONS.—For the best display of named
es, to E. S. Rand, Jr., ... $35 00
ize, to Joseph Clark, ... 10 00

s:—

mley, for *Hibiscus cruentus*, . . . 1 00
" " choice Cut Flowers, . . . 4 00
. Wheeler, for Cut Flowers, . . . 1 00
oyce, " " " 2 00
. Wood, " " " 2 00
re, " " " 3 00
Co., " " " 1 00
. Kenrick, " Magnolias, ... 1 00
. S. Horner, " Native Flowers, . . . 3 00
kinson, " specimen Azalea, . . 10 00
nnewell, " Rhododendrons, . . . 10 00
d, Jr., " " . . . 3 00
r, " *Datura Knightii*, . . 1 00
" Iris, ... 1 00
Davenport, " Native Plants, . . . 1 00
odford, " Clematis, ... 3 00
Co., " " 1 00
ark, " *Myosotis*, ... 1 00
ark, " Azaleas, ... 2 00

JUNE 17.

—

son, for Native Plants, ... 3 00
d, Jr., " Rhododendrons, ... 5 00
mley, " Roses, ... 3 00
. Wheeler, for Cut Flowers, . . . 1 00

ROSE EXHIBITION.

June 21.

HARDY PERPETUAL ROSES. — For the best twenty-four distinct named varieties, three of each variety, to William Gray, Jr., ... $20 00

For the best twelve distinct named varieties, to James Comley, ... 10 00

For the second best, to J. H. Woodford, . . . 8 00

For the best six distinct named varieties, to J. B. Moore, ... 5 00

For the best three named varieties, to W. Gray, Jr., . 4 00

For the second best, to James Comley, ... 2 00

MOSS ROSES. — For the best twelve named varieties, to C. M. Atkinson, ... 10 00

TENDER ROSES. — For the best twelve named varieties, to James Comley, ... 10 00

For the best twelve Maréchal Niel, to James Comley, . 5 00

GENERAL DISPLAY. — For the best, to Francis Parkman, 15 00

For the second best, to Joseph Clark, . . . 10 00

Hunnewell Special Prizes.

For the best six new varieties sent out since 1872, to William Gray, Jr., ... 40 00

For the best six named varieties, to William Gray, Jr., . 20 00

For the second best, to C. M. Atkinson, . . . 10 00

For the best twelve of any one variety, to William Gray, Jr., 20 00

Gray Special Prizes.

For the best twelve of any one variety, to J. C. Chaffin, 25 00

For the best six of any one variety, to James Comley, . 15 00

For the best twelve named varieties, to Francis Parkman, 25 00

Comley Special Prize.

For the best single flower of a Hybrid Perpetual Rose, to J. C. Chaffin, ... 5 00

STOVE AND GREENHOUSE FLOWERING PLANTS.—For the best six distinct varieties in bloom, to H. H. Hunnewell, ... 30 00

For the second best, to E. S. Rand, Jr., . . 20 00

NT.—Regard being had to new and rare s. For the best specimen plant, of a kind ch no special prize is offered, to H. H. vell, ...	$10 00
For the best single specimen, to Joseph Clark,	3 00
S.—For the best display of named species ieties, one bottle of each, to Mrs. C. N. S. , ...	5 00
E.—For the best specimen, to W. H. y, ...	10 00
nd best, to Hovey & Co., . . .	8 00
For the best, not to exceed fifteen inches in r, to W. H. Halliday, ...	5 00
nd best, to W. H. Halliday, . . .	4 00
MS.—For the best thirty trusses, not less n distinct varieties, to Joseph Clark, .	4 00
nd best, to James Nugent, . . .	3 00
BACEOUS PLANTS.—For the best display of species and varieties, to Francis Parkman,	5 00
nd best, to James McTear, . . .	4 00
.—For the best display, to Hovey & Co., .	5 00
econd best, to W. K. Wood, . . .	4 00
ird best, to James Comley, . . .	3 00
.—For the best, other than a Basket of s, to Mrs. E. M. Gill, ...	5 00
econd best, to Mrs. S. Joyce, . . .	4 00
ird best, to Mrs. A. D. Wood, . .	3 00
TS.—For the best pair, to Hovey & Co., .	4 00
econd best, to Mrs. S. Joyce, . . .	3 00
:	
nnewell, for a fine display of Cut Flowers, .	3 00
Co., for Seedling Pæonies, . . .	2 00
d, Jr., for *Cypripedium niveum*, . .	1 00
I. Gill, " Cut Flowers, ...	2 00
re, " " "	2 00
. Story, " " "	2 00
d, Jr., " " "	1 00
Tobey, " " "	1 00
chings, " Native "	1 00

To H. H. Hunnewell, for Tricolor Pelargoniums,	. .	$6 00
James Comley, " *Hydrangea Otaksa*,	. .	4 00
Miss C.L. Tallant, " *Cypripedium spectabile*,	. .	1 00
C. M. Atkinson, " Sarracenias,	. .	3 00
A. McLaren, " *Tabernæmontana*,	. .	2 00
Hovey & Co., " collection of Plants,	. .	6 00
James Comley, " Pot Plants,	. .	4 00
Miss A. C. Wheeler, for Roses,	. .	2 00
J. B. Moore, " "	. .	5 00
J. S. Richards, " "	. .	4 00
Mrs. J. W. Wilcox, " "	. .	1 00
W. H. Spooner, " "	. .	3 00
J. B. Moore, " "	. .	5 00
C. M. Atkinson, " "	. .	3 00
Hovey & Co., " "	. .	2 00
B. G. Smith, " "	. .	2 00
Miss E. Farrington, " "	. .	1 00
A. McLaren, " "	. .	2 00

JUNE 24.

Gratuities: —

To Miss S. W. Story, for Cut Flowers,	. .	1 00
E. S. Rand, Jr., " " "	. .	2 00
W. H. Spooner, for Roses,	. .	2 00
B. G. Smith, " "	. .	1 00
James Comley, " "	. .	4 00

STRAWBERRY SHOW.

JUNE 27.

CUT FLOWERS.—For the best display, filling 150 bottles, to Hovey & Co.,	$5 00
For the second best, to Mrs. E. M. Gill,	4 00
For the third best, to Mrs. A. D. Wood,	3 00
BASKET OF FLOWERS.—For the best arranged, to Hovey & Co.,	3 00
For the second best, to Mrs. S. Joyce,	2 00
PARLOR BOUQUETS.—For the best pair, to James Comley,	3 00

s: —

ray, Jr.,	for Roses,		$2 00
nley,	" "		4 00
ooner,	" "		2 00
d, Jr.,	" Cut Flowers,		2 00
nley,	" " "		1 00
Kenrick,	" " "		1 00
Chase,	" " "		1 00
oyce,	" " "		1 00
Rand,	" " "		1 00
ards,	" " "		3 00
Wheeler,	" " "		1 00
. Story,	" *Tabernæmontana*,		2 00
S. Horner,	" Native Flowers,		2 00
chings,	" " "		3 00
Smith,	" " "		2 00
. Carter,	" " "		1 00

JULY 1.

—For the best ten named varieties, to
Parkman, ... 4 00

s: —

rkman,	for Delphiniums,	3 00
hea,	" "	1 00
nley,	" Rhododendron,	1 00
	" Cut Flowers,	1 00
d, Jr.,	" *Stanhopea Ruckeri*,	2 00
. Story,	" Lilies,	1 00
Wheeler,	" "	1 00
rk,	" Sweet Williams,	2 00
rkman.	" Clematis,	1 00

JULY 8.

. — For the best display, filling 150 bottles.

ey & Co.,	5 00
econd best, to James Comley,	4 00
hird best, to Mrs. E. M. Gill,	3 00

. — For the best, other than a Basket of
s, to Mrs. S. Joyce, ... 3 00
econd best, to Mrs. A. D. Wood, . . 2 00

Gratuities: —

To Edward S. Rand, Jr., for	*Vanda suavis*, . . .	$3 00
Hovey & Co., "	*Phaius maculatus*, . .	1 00
C. T. Hubbard, "	*Oncidium flexuosum*, . .	1 00
Miss S. W. Story, "	Dish of Flowers, . .	2 00
Geo. N. Smith, "	Native " . .	1 00
Geo. E. Davenport, "	" " . .	1 00
Mrs. C. N. S. Horner, "	" " . .	2 00
Francis Putnam, "	Cut " . .	2 00
J. S. Richards, "	" " . .	2 00
Miss A. C. Wheeler, "	" " . .	1 00
Mrs. E. M. Gill, "	" " . .	1 00

JULY 15.

CUT FLOWERS.—For the best display, filling 150 bottles, to Hovey & Co., ...	5 00
For the second best, to W. K. Wood, . . .	4 00
For the third best, to Mrs. E. M. Gill, . . .	3 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce, ...	3 00
For the second best, to Mrs. A. D. Wood, . .	2 00
NATIVE PLANTS. — For the best display of named species and varieties, to Mrs. C. N. S. Horner, . .	5 00
For the second best, to E. H. Hitchings, . .	4 00

Gratuities: —

To James Comley, for	Plants and Flowers, . . .	2 00
" " "	*Yucca aloifolia*, ...	4 00
" " "	*Lilium Canadense*, . . .	3 00
Calder & Wiswell, for	*Nymphæa odorata*, . . .	1 00
George E. Davenport, for	Native Ferns, . . .	3 00
Mrs. E. M. Gill, "	Basket of Flowers, . .	2 00
Miss S. W. Story, "	Lilies, ...	1 00
Francis Putnam, "	" and Amaryllis, .	1 00
James Nugent, "	Cut Flowers, . . .	1 00
James Comley, "	" " . . .	1 00
J. S. Richards, "	" " . . .	1 00
Miss L. P. Weston, "	" " . .	1 00
Miss A. C. Wheeler, "	" " . . .	1 00

JULY 22.

r the best three varieties in bloom, to E. d, Jr.,	$10 00
econd best, to E. S. Rand, Jr.,	8 00
—For the best display, filling 150 bottles, to & Co.,	5 00
econd best, to W. K. Wood,	4 00
hird best, to Mrs. E. M. Gill,	3 00
LOWERS.—For the best arranged, to Hovey	3 00
econd best, to Mrs. S. Joyce,	2 00
UETS.—For the best pair, to James Comley,	3 00
TS.—For the best pair, to James O'Brien,	3 00
econd best, to Mrs. E. M. Gill,	2 00
:—	
loore, for *Caladium argyrites*,	3 00
nley, " Ferns,	1 00
Co., " *Aloe saponaria*,	2 00
rien, " Hollyhocks,	3 00
d, Jr., " *Ixora amabilis*,	2 00
hings, " *Nymphæa odorata*,	1 00
. Wheeler, for Cut Flowers,	1 00
rd, " " "	1 00
re, " " "	1 00
. Wood, " Dish of Flowers,	2 00

JULY 29.

. — For the best display, filling 150 bottles, K. Wood,	5 00
econd best, to James Comley,	4 00
hird best, to Hovey & Co.,	3 00
est collection of fifty named varieties of louse Flowers, to Hovey & Co.,	6 00
LOWERS. — For the best arranged, to Hovey	3 00
econd best, to Mrs. S. Joyce,	2 00

Gratuities: —

To E. S. Rand, Jr., for *Dendrobium Devonianum*, . . $2 00
J. S. Richards, " Gladioli, ... 3 00
W. K. Wood, " Fungi, ... 2 00
Mrs. E. M. Gill, " Basket of Native Flowers, . 1 00
E. H. Hitchings, " " " . . 1 00
Mrs. C. N. S. Horner, for " " . . 2 00
Miss A. C. Wheeler, " Cut " . . 1 00
James Nugent, " " " . . 1 00
Mrs. E. M. Gill, " " " . . 3 00
George Craft, " " " . . 1 00

AUGUST 5.

BALSAMS.—For the best twelve spikes, eight varieties, to J. B. Moore, ... 4 00
For the second best, to Samuel Hartwell, . . 3 00
HAND BOUQUETS. — For the best pair, to J. O'Brien, . 3 00
For the second best, to James Nugent, . . . 2 00
CUT FLOWERS. — For the best display, filling 150 bottles, to J. Comley, ... 5 00
For the second best, to W. K. Wood, . . . 4 00
For the third best, to Hovey & Co., . . 3 00
For the best collection of fifty named varieties of Annuals and Perennials, to Hovey & Co., . . 6 00
TABLE DESIGN. — For the best, other than a Basket of Flowers, to Hovey & Co., ... 3 00
For the second best, to Mrs. S. Joyce. . . . 2 00

Gratuities: —

To Hovey & Co., for *Monstrosa deliciosa*, . . . 2 00
J. S. Richards, " Gladioli, ... 4 00
Mrs. E. M. Gill, " Balsams, ... 1 00
Mrs. S. Joyce, " " 1 00
Mrs. C. N. S. Horner, for Native Flowers, . . 2 00
E. H. Hitchings, " " " . . . 1 00
E. Shepherd, " Cut " . . . 1 00
John B. Moore, " " " . . . 2 00
E. A. Story, " " " . . . 1 00
James Nugent, " Vase of " . . . 1 00

C. Wheeler,	for Dish of Flowers,	$1 00
. Gill,	" " " "	1 00
"	" stand of Cut Flowers,	2 00
aft,	" " " "	1 00

AUGUST 12.

s. — For the best ten distinct named varie-
Francis Parkman, ... 4 00
econd best, to Hovey & Co., . . . 3 00
For the best collection of double and single,
50 bottles, to E. W. Wood, . . . 4 00
econd best, to James Cartwright, . . 3 00
. — For the best display, filling 150 bottles,
es Comley, ... 5 00
econd best, to W. K. Wood, . . . 4 00
hird best, to Mrs. E. M. Gill, . . . 3 00
t collection of fifty named varieties of Green-
Flowers, to C. M. Atkinson, . . . 6 00
econd best, to Hovey & Co., . . . 4 00
FLOWERS.—For the best arranged, to Hovey
. . . . . 3 00
econd best, to Mrs. A. D. Wood, . . 2 00
s.—For the best display of named species
rieties, one bottle of each, to Mrs. C. N. S.
, ... 5 00
s:

ffy, for	*Amaryllis Belladonna*,	5 00
ards, for	Gladioli,	5 00
n, "	"	1 00
th, "	Phlox,	1 00
nley, "	Seedling Phlox,	2 00
yce, "	Balsams,	1 00
s, "	"	1 00
chings, for	Native Flowers,	2 00
Smith, "	"	2 00
. S. Horner, "	"	2 00
. Wheeler, for	Cut Flowers,	1 00
re, "	"	1 00
aft, "	"	2 00

To James Nugent, for Cut Flowers, ... $1 00
" " " Bouquet, ... 1 00
Mrs. C. B. Chase, for Dish of Flowers, . . . 1 00

AUGUST 19.

GLADIOLI.—For the best twenty named varieties, to J. S. Richards, ... 10 00
For the best ten named varieties, to J. B. Moore, . 6 00
For the second best, to A. McLaren, ... 5 00
For the third best, to George Craft, ... 4 00
For the best display of named or unnamed varieties, to J. S. Richards, ... 10 00
For the second best, to George Craft, . . . 8 00
For the third best, to Herbert Gleason, . . . 6 00
CUT FLOWERS.—For the best display, filling 150 bottles, to James Comley, ... 5 00
For the second best, to W. K. Wood, ... 4 00
For the third best, to Hovey & Co., ... 3 00
For the best collection of fifty named varieties of Annuals and Perennials, to Hovey & Co., ... 6 00
BOUQUETS.—For the best pair of Parlor Bouquets, to James Nugent, ... 3 00
For the best pair of Hand Bouquets, to J. O'Brien, . 3 00
For the second best, to Hovey & Co., ... 2 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Hovey & Co., ... 3 00
For the second best, to Mrs. S. Joyce, . . . 2 00

Gratuities:—

To H. E. Smith, for *Amaryllis Smithii*, ... 1 00
Hovey & Co., for *Ixora*, ... 1 00
C. M. Atkinson, for *Eryngium platyphyllum*, . . 1 00
Mrs. E. M. Gill, for *Agapanthus*, ... 1 00
Miss S. W. Story, for Lilies, ... 1 00
W. H. Spooner, " " 2 00
Mrs. E. M. Gill, for Balsams, ... 1 00
Miss A. C. Wheeler, for Dish of Flowers, . . . 1 00
James Nugent, for Vase of Flowers, . . . 1 00
Mrs. A. D. Wood, for Basket of Flowers, . 2 00

. S. Horner, for Native Flowers, . . $2 00
" " " " Ferns, . . . 1 00
rd, for Cut Flowers, ... 1 00
s, " " " 3 00
re, " " " 1 00
, " " " 2 00

AUGUST 26.

the best thirty flowers, not less than ten
es, to C. M. Atkinson, ... 5 00
econd best, to J. B. Moore, . . . 4 00
hird best, to J. A. Black, ... 3 00
t twenty flowers, not less than six varieties,
es Nugent, ... 3 00
econd best, to Hovey & Co., . . . 2 00
or the best sixty blooms, not less than six
es, in bunches of three of the same variety,
B. Moore, ... 4 00
econd best, to James Nugent, . . . 3 00
.—For the best display, filling 150 bottles,
. Moore, ... 5 00
econd best, to W. K. Wood, . . . 4 00
hird best, to James Comley, . . . 3 00
fifty named varieties of Greenhouse Flowers,
ey & Co., ... 6 00
econd best, to C. M. Atkinson, . . . 4 00
LOWERS.—For the best arranged, to Hovey
. . . . . 3 00
econd best, to Mrs. A. D. Wood, . . 2 00

s:—

ooner, for Lilies, ... 2 00
" " Gladioli, ... 1 00
aft, " " 4 00
ards, " " 4 00
Davenport, for Native Flowers, . . 1 00
en, for *Hydrangea paniculata grandiflora*, . 1 00
Co., for Asters, ... 1 00
yce, for Dish of Flowers, ... 2 00
. Wheeler, for Dish of Flowers, . . 1 00

To J. B. Moore, for Cut Flowers, ... $1 0
Mrs. E. M. Gill, for Cut Flowers, ... 2 0
W. J. Vass, " " " 2 0
James Nugent, " " " 2 0

SEPTEMBER 2.

LILIES.—For the best display of *Lilium lancifolium*, cut flowers, to W. H. Spooner, ... 5 0
For the second best, to Hovey & Co., . . . 4 0
VERBENAS.—For the best collection, filling 50 bottles, to Edmund S. Smith, ... 4 0
For the second best, to J. O'Brien, ... 3 0
CUT FLOWERS.—For the best display, filling 150 bottles, to W. K. Wood, ... 5 0
For the second best, to J. O'Brien, ... 4 0
For the third best, to J. Comley, ... 3 0
For the best collection of fifty named varieties of Annuals and Perennials, to Hovey & Co., ... 6 0
BASKETS OF FLOWERS.—For the best arranged, to Hovey & Co., ... 3 0
For the second best, to Mrs. A. D. Wood, . . 2 0
NATIVE PLANTS.—For the best display of named species and varieties, to Mrs. C. N. S. Horner, . . 5 0

Gratuities:—

To A. P. Calder, for *Hydrangea paniculata grandiflora*, . 1 0
W. H. Spooner, for Gladioli, ... 1 0
J. S. Richards, " " 4 0
W. H. Spooner, for Asters, ... 1 0
E. R. Mudge, " " 1 0
Samuel G. Stone, for Dahlias, ... 1 0
Miss S. W. Story, for Lilies, ... 1 0
Mrs. E. M. Gill, for Cut Flowers, ... 2 0
James Nugent, " " " 1 0
W. J. Vass, " " " 2 0
J. B. Moore, " " " 3 0
Mrs. S. Joyce, " Basket of Flowers, . . . 2 0
Miss A. C. Wheeler, for Dish of Flowers, . . 1 0

SEPTEMBER 9.

AS.—For the best thirty flowers, not less	
x varieties, to George Craft, . . .	$4 00
econd best, to James Nugent, . . .	3 00
—For the best display, filling 150 bottles,	
K. Wood, ...	5 00
econd best, to J. O'Brien, ...	4 00
ird best, to Mrs. E. M. Gill, . . .	3 00
collection of fifty named varieties of Green-	
Flowers, to Hovey & Co., ...	6 00
econd best, to J. McTear, ...	4 00
OWERS.—For the best arranged, to Hovey	
. . . . .	3 00
econd best, to Mrs. A. D. Wood, . .	2 00
.—For the best, other than a Basket of	
, to Hovey & Co., ...	3 00
econd best, to Mrs. S. Joyce, . . .	2 00
:—	
oner, for Lilies, ...	2 00
. Story, for Lilies, ...	1 00
h, for Cockscombs, ...	1 00
er, for Hydrangeas, ...	2 00
ft, for Gladioli and Zinnias, . . .	4 00
rds, " "	5 00
o., for Cypripedium, ...	1 00
Stone, for Dahlias, ...	2 00
Wheeler, for Dish of Flowers, . . .	1 00
Chase, " " " . . .	1 00
ley, for Cut Flowers, . . .	2 00
" " "	1 00
e, " " "	2 00
o., " Azaleas, ...	3 00

ANNUAL EXHIBITION.

SEPTEMBER 19, 20, 21, AND 22.

PLANTS.—For the best twelve greenhouse and	
lants, of different varieties, to F. L. Ames,	$35 00
econd best, to Hovey & Co., . . .	30 00

SPECIMEN PLANT.—For the best, not variegated, of a kind for which no special prize is offered, to Hovey & Co.,	$10 00
For the second best, to William Gray, Jr.,	6 00
SPECIMEN FLOWERING PLANT. — For the best, to Hovey & Co.,	10 00
For the second best, to Hovey & Co.,	6 00
VARIEGATED LEAVED PLANTS. — For the best six varieties, not offered in the collection of greenhouse plants, to Hovey & Co.,	15 00
For the second best, to William Gray, Jr.,	10 00
For the best single specimen, not offered in any collection, to William Gray, Jr.,	5 00
For the second best, to J. B. Moore,	4 00
CALADIUMS.—For the best six varieties, to C. M. Atkinson,	6 00
For the second best, to Hovey & Co.,	5 00
FERNS. — For the best nine named varieties, to F. L. Ames,	15 00
For the second best, to Hovey & Co.,	10 00
For the best six new varieties, to J. Warren Merrill,	10 00
ADIANTUMS. — For the best six varieties, to Hovey & Co.,	10 00
TREE FERNS. — For the best pair, to J. Warren Merrill,	15 00
DRACÆNAS. — For the best six named varieties, to Hovey & Co.,	10 00
PALMS. — For the best pair, to William Gray, Jr.,	10 00
For the second best, to Hovey & Co.,	6 00
AGAVES. — For the best six distinct varieties, to Hovey & Co.,	15 00
For the second best, to E. S. Rand, Jr.,	10 00
CACTI. — For the best twenty-five species and varieties, to John C. Hovey,	10 00
SUCCULENTS. — For the best collection, (other than Agaves and Cacti), of twenty-five species and varieties, to John C. Hovey,	15 00
BEST NEW POT PLANT, it having never before been shown at any exhibition of the Society, to F. L. Ames, the Society's Silver Medal.	
CELOSIA PYRAMIDALIS. — For the best four, to C. M. Atkinson,	5 00
GLADIOLI. — For the best display and best kept during the exhibition, of named or unnamed varieties, filling 200 bottles, to George Craft,	10 00

second best, to A. McLaren, . . .	$8 00
third best, to J. S. Richards, . . .	6 00
For the best twelve named varieties, to S. G.	
. . . . .	6 00
st six named varieties, to C. M. Atkinson, .	4 00
st single flower, to C. M. Atkinson, . .	2 00
second best single flower, to S. G. Stone, .	1 00
— For the best general display, filling 50 bot-	
o S. G. Stone, ...	4 00
QUETS. — For the best pair exhibited on	
esday, to James O'Brien, ...	6 00
second best, to James Nugent, . . .	4 00
ETS. — For the best, to Mrs. E. M. Gill, .	6 00
second best, to James O'Brien, . . .	4 00
QUETS. — For the best pair exhibited on	
day, to James Nugent, ...	6 00
second best, to James O'Brien, . . .	4 00
ETS. — For the best, to Mrs. S. Joyce, .	6 00
second best, to J. O'Brien, . . .	4 00
RS. — For the best display and best kept	
gh the exhibition, filling 100 bottles, to W.	
ood, ...	18 00
second best, to Hovey & Co., . . .	16 00
third best, to Mrs. E. M. Gill, . . .	14 00
fourth best, to W. C. Strong, . . .	12 00
fifth best, to J. O'Brien, ...	10 00
sixth best, to James Nugent, . . .	8 00
seventh best, to A. H. Dunlap, . . .	6 00
LOWERS. — For the best arranged, on Tues-	
o Hovey & Co., ...	5 00
second best, to Mrs. S. Joyce, . . .	4 00
st arranged, on Thursday, to Mrs. S. Joyce,	5 00
second best, to Hovey & Co., . . .	4 00
D. — For the best specimen, not less than	
feet in height, to Hovey & Co., . . .	10 00
second best, to W. J. Vass, . . .	8 00
N. — For the best, to be arranged without	
and not to exceed four feet in height, to	
& Co., ...	10 00
second best, to Mrs. E. M. Gill, . .	8 00

Hunnewell Premiums.

EVERGREEN TREES AND SHRUBS. — For the best display in pots, to W. C. Strong,	$8 00
For the second best, to J. W. Manning,	5 00

Gratuities: —

To E. S. Rand, Jr., for *Lycopodium Japonicum*,	1 00
M. H. Merriam, " *Lapageria alba*,	2 00
W. T. Andrews, " *Zephyranthes candida*,	1 00
C. M. Atkinson, " *Dionœa muscipula*,	2 00
E. H. Hitchings, " *Botrychium ternatum*,	2 00
Hovey & Co., " *Yucca aloifolia*,	3 00
F. L. Ames, " collection of Plants,	4 00
W. J. Vass, " " "	10 00
Wm. Gray, Jr., " " "	10 00
E. S. Rand, Jr., " " "	4 00
Hovey & Co., " " "	10 00
W. T. Andrews, " " Caladiums,	10 00
J. B. Moore, " " "	4 00
J. Warren Merrill, for collection of Ferns,	10 00
J. W. Manning, for Evergreens,	5 00
Hovey & Co., " "	4 00
Miss S. W. Story, for Lilies,	2 00
C. T. Smith, " Cockscombs,	2 00
Samuel G. Stone, " Dahlias,	2 00
W. H. Spooner, " Gladioli,	1 00
D. R. Beckford, Jr., " Native Flowers,	1 00
Mrs. C. N. S. Horner, for " "	5 00
Mrs. E. M. Gill, for Cut Flowers,	1 00
C. M. Atkinson, " " "	1 00
W. C. Strong, " " "	5 00
George Craft, " " "	3 00
J. B. Moore, " " "	2 00
A. H. Dunlap, " " "	3 00
Miss A. C. Wheeler, for Dish of Flowers,	1 00
Mrs. S. Joyce, " " "	1 00
James Nugent, " Large Bouquets,	6 00
Miss S. W. Story, " Design,	3 00
D. R. Beckford, Jr., " Wardian Case,	8 00
W. H. Halliday, " " "	5 00

law, for Wardian Case,	$5 00
erich, for " "	3 00
lliday " Fern "	4 00

SEPTEMBER 30.

s: —

erd, for Dahlias,	1 00
N. S. Horner, for Native Flowers,	2 00
oyce, for Basket of "	2 00

OCTOBER 7.

N. — For the best, other than a Basket of rs, to Mrs. S. Joyce,	3 00
QUETS. — For the best pair, to James Nugent,	4 00
ETS. — For the best pair, to James O'Brien,	3 00
second best, to Mrs. S. Joyce,	2 00

s: —

oyce, for *Anemone Japonica alba*,	1 00
C. Wheeler, for Basket of Flowers,	1 00
D. Wood, " " "	2 00
Moore, for Cut Flowers,	2 00
gent, " " "	1 00
N. S. Horner, for Native Flowers,	2 00
ne, for Dahlias,	5 00
ith, " "	1 00
rd, " "	1 00
Co., " "	2 00
" " Plants,	2 00

OCTOBER 14.

s: —

D. Wood, for Basket of Flowers,	2 00
oyce, " " "	2 00
M. Gill, " Cut Flowers,	1 00
C. Wheeler, for Dahlias,	1 00
ne, " "	2 00
V. Story, " Grasses,	1 00

OCTOBER 21.

Gratuities: —

To Mrs. E. M. Gill, for Basket of Flowers,	$2 00
Mrs. S. Joyce, " " "	2 00
Mrs. C. N. S. Horner, for Native Flowers,	2 00
Miss A. C. Wheeler, for Cut Flowers,	1 00
Miss S. W. Story, " " "	1 00

OCTOBER 28.

Gratuities: —

To Mrs. A. D. Wood, for Basket of Flowers,	2 00
Mrs. S. Joyce; " " "	2 00
D. R. Beckford, Jr., for Dish of Flowers,	1 00
Miss A. C. Wheeler, " Cut "	1 00
Miss S. W. Story, " " "	1 00
Mrs. E. M. Gill, " " "	2 00
Hovey & Co., " Orchid,	1 00
H. Weld Fuller, " *Melocactus communis*,	1 00

NOVEMBER 4.

Gratuities:—

To Miss A. C. Wheeler, for Cut Flowers,	1 00
Miss S. W. Story, " " "	1 00
Mrs. E. M. Gill, " " "	2 00
Mrs. S. Joyce, " Basket of Flowers,	1 00
Hovey & Co., for *Epiphyllum truncatum*,	2 00
Mrs. C. N. S. Horner, for Native Ferns and Mosses,	2 00

CHRYSANTHEMUM SHOW.

NOVEMBER 11.

CHRYSANTHEMUMS. — For the best six distinct Large Flowered varieties, to Joseph Clark,	$10 00
For the second best, to C. M. Atkinson,	6 00
For the best six distinct named Pompons, to Joseph Clark,	10 00
For the second best, to C. M. Atkinson,	6 00
For the best specimen plant, to Joseph Clark,	5 00
For the second best, to C. M. Atkinson,	3 00

t twelve named Large Flowered varieties,
ecimens, to C. M. Atkinson, . . . $3 00
econd best, to Joseph Clark, . . . 2 00
twelve named Pompon varieties, Cut Speci-
o Joseph Clark, ... 3 00
econd best, to James Nugent, . . . 2 00
t General Display, named or unnamed va-
Cut Specimens, to Joseph Clark, . . 5 00
econd best, to E. Shepherd, . . . 4 00
hird best, to James Nugent, . . . 3 00
OWERS. — For the best arranged, to Mrs. S.
. . . . . 3 00
econd best, to Hovey & Co., . . . 2 00
TS. — For the best pair, to Mrs. E. M. Gill, 3 00
econd best, to James Nugent, . . . 2 00

:—

inson, for *Sarracenia Drummondi*, . . 2 00
th, " Chrysanthemums, . . . 2 00
e, " Cut Flowers, ... 2 00
Story, " " " 2 00
Wheeler, for Cut Flowers, . . . 1 00
ley, " " " 1 00
Gill, " " " 1 00
od, " " " 1 00
Wood, " Dish of Flowers, . . 2 00
Gill, " " " " . . . 1 00
Weston, " Bouquet, ... 1 00

NOVEMBER 18.

:—

bard, for *Zygopetalum crinitum*, . . 1 00
Story, for Cut Flowers, ... 1 00
ley, " " " 1 00
yce, " " " 1 00
Wheeler, for Basket of Flowers, . . 1 00
Wood, " " " . . . 2 00
Gill, " " " . . . 1 00
Weston, " " " . . . 1 00
kford, Jr., " " " . . . 1 00

NOVEMBER 25.

Gratuities: —

To James Comley, for Cut Flowers,	$1 00
Mrs. A. D. Wood, for Basket of Flowers,	1 00
D. R. Beckford, Jr., " " " "	1 00
Mrs. S. Joyce, " " " "	1 00

DECEMBER 2.

Gratuities: —

To Mrs. A. D. Wood, for Basket of Flowers,	2 00
Mrs. S. Joyce, " " " "	1 00

DECEMBER 9.

Gratuities: —

To James Comley, for Cut Flowers,	1 00
C. T. Hubbard, for *Cypripedium insigne*,	1 00
Miss S. W. Story, for Vase of Flowers,	1 00
Mrs. A. D. Wood, for Basket of Flowers,	1 00

The following Medals, Certificates of Merit, and Prospectiv Prizes, have been awarded:

February 12. To John F. Rogers, for Specimen Azalea Crite rion, Silver Medal.

February 19. To Francis Putnam, for Seedling Amaryllis, Firs Class Certificate of Merit.

March 18. To C. S. Sargent, for *Phormium tenax variegatum* in flower, Silver Medal.

April 15. To John H. Moore, for Seedling Gloxinia, First Clas Certificate of Merit.

May 20. To John Cadness, for new Hydrangea, Thomas Hogg Silver Medal.

June 3. To Hovey & Co., for *Epiphyllum Hoveyi*, First Clas Certificate of Merit.

June 10. To E. S. Rand, Jr., for Seedling Rhododendron, Dais Rand, the Prospective Prize of $40.

June 27. To John Robinson, for a choice collection of Nativ Ferns, Silver Medal.

July 8. To F. L. Ames, for new and rare Orchids, Silv Medal.

To Francis Parkman, for *Lilium Parkmanni*, the Prize of $40.

. To Francis Parkman, for the best Seedling Late Medal.

hibition. To F. L. Ames, for the best new pot plant, *Sedeni*, Silver Medal.

t awarded to each contributor is as follows:

. .	$1 00	A. Greenlaw, . .	$5 00
. .	54 00	W. H. Halliday, . .	28 00
ws, . .	11 00	Samuel Hartwell, .	3 00
on, . .	179 00	E. H. Hitchings, .	16 00
, . .	2 00	Mrs. C. N. S. Horner,	61 00
rd, Jr., .	12 00	Hovey & Co., . .	513 00
, . .	6 00	J. C. Hovey, . .	26 00
Carter .	1 00	C. T. Hubbard, . .	4 00
right, .	9 00	H. H. Hunnewell, .	59 00
, . .	30 00	Institution for the Blind,	1 00
Chase .	3 00	Mrs. S. Joyce, . .	119 00
Clapp, .	1 00	Miss A. C. Kenrick, .	11 00
, . .	68 00	A. S. Lewis, . .	2 00
, . .	1 00	J. W. Manning, . .	10 00
y, . .	302 00	A. McLaren, . .	18 00
, . .	41 00	J. McTear, . .	16 00
kshanks, .	1 00	M. H. Merriam, . .	2 00
venport, .	14 00	J. Warren Merrill, .	37 00
son, .	2 00	Eddie W. Mitchell, .	1 00
h, . .	3 00	J. B. Moore, . .	179 00
, . .	5 00	E. R. Mudge, . .	1 00
p, . .	9 00	Norton Brothers, .	5 00
ott . .	1 00	James Nugent, . .	75 00
ington, .	1 00	J. O'Brien, . .	65 00
, . .	8 00	M. C. O'Shea, . .	1 00
r, . .	2 00	Francis Parkman, .	103 00
er, . .	11 00	Francis Putnam, .	13 00
Gill, . .	132 00	E. S. Rand, Jr., .	300 00
, . .	3 00	Harry S. Rand, . .	1 00
. .	6 00	J. S. Richards, . .	63 00
., . .	200 00	John Robinson, . .	6 00
, . .	4 00	John F. Rogers, . .	26 00

Waldo O. Ross,	$1 00	Miss M. B. Tobey,	$1
C. S. Sargent,	2 00	Twombley & Sons,	1
E. Shepherd,	18 00	W. J. Vass,	26
Mrs. Sherman,	1 00	John Vose,	2
Benj. G. Smith,	20 00	Mrs. L. P. Weston,	4
Edmund S. Smith,	7 00	Miss A. C. Wheeler,	28
George N. Smith,	6 00	J. W. Wilcox,	1
H. E. Smith,	2 00	Marshall P. Wilder,	48
W. H. Spooner,	21 00	Mrs. A. D. Wood,	83
Samuel G. Stone,	23 00	E. W. Wood,	4
Miss S. W. Story,	48 00	W. K. Wood,	74
W. C. Strong,	21 00	J. H. Woodford,	11
Miss C. L. Tallant,	2 00	D. Zirngiebel,	2
Thomas Tapper,	1 00		

Amount appropriated,	$3,200 00
" awarded,	3,023 00
Balance,	$177 00

Amount awarded for Hunnewell Special Prizes,	$183 00
" " " Gray	140 00
" " " Comley	5 00

REPORT

OF THE

COMMITTEE ON FRUITS.

FOR THE YEAR 1876.

BY HERVEY DAVIS, CHAIRMAN.

As the swift and fleeting hours of time pass, and another fruit season draws to a close, it becomes our duty to examine and report upon the past, present, and future condition and prospects of the supply and demand for fruits in Massachusetts. In relation to the past, we have to acknowledge a great change. In going back but a few years, we notice a marked difference in the supply of strawberries. It is but a short time since our strawberry season lasted only from the 15th of June to the 10th of July; but now, owing to the improved facilities of transportation, our markets are supplied with this very desirable fruit from about the 1st of May until the 10th of July, and at a much less price than formerly. The same rule will apply to almost all kinds of fruits, as regards the increased length of time, and the prices we have to pay.

Besides the strawberry, a very striking instance may be found in the grape. It is but a very few years since, that almost the only varieties of grapes we had were the Isabella and Concord, and those in very limited quantities; but now we are supplied with this fruit, from the South and West, from early in August until late in the season, when California comes in with her abundant crops, and continues the season of this desirable fruit until mid-winter. With this great increase of fruits from the South and West, and the great interest taken in the Eastern States, with their innumerable varieties of the different kinds of fruit now grown, and the equally great interest shown in raising new hybrid and other seedlings, we should have no fear for the present and future supply of all kinds of fruit, covering nearly the entire year, from January to December.

The season of 1876 was void of extremes, in either moisture o dryness, heat or cold; and, owing to this favorable condition of th season, we have been blessed with an abundant crop of almos every kind of fruit, and at very moderate prices, which has con tributed much to supply the wants and comforts of all classes o our citizens, the poor as well as the rich, in this year of grea depression and want.

STRAWBERRIES.—The only exhibitions of forced strawberries wer from R. Oldreive, March 4th, and George Cruickshanks, Marc 25th, and these in very limited quantities. Strawberries grown i frames under glass were exhibited by Charles Garfield, May 27t and June 3d, 10th, and 17th; by Marshall P. Wilder, June 10th and by C. E. Grant, June 17th. The crop of strawberries was in jured in some places by the vines being winter-killed, but not t any great extent. The exhibition of this fruit has been above th average of seasons, but not as good as last year.

The first prize for the best four quarts, at the Rose Show, Jun 21st, was awarded to John B. Moore, for his seedling, Genera Sherman. Mr. Moore makes the strawberry a specialty on hi farm, and it will be noticed by reference to the list of awards tha he has received a large proportion of the prizes for this fruit. W wish to call particular attention to his collection, as it will be see that he has been interested in raising seedlings, and very successfu Among those raised by him and put upon the market, are the Ge eral Sherman, a very large and handsome berry, and of good qua ity. Caroline, a description of which has been given in a previou report, is also a large and handsome berry; quality first rate, and very abundant bearer. We have seen it growing in abundance o Mr. Moore's grounds in Concord in 1875 and 1876, and consider the best and most valuable seedling originated by him. Grace another of his seedlings, is by some considered the best in qualit of any he has raised; but in other respects not as valuable. Th Committee having visited Mr. Moore's grounds, in the last straw berry season, found the same order and neatness in his beds, an extending to every part of his farm, as was noticed in a previou visit. These points are worthy of imitation by all who desire t grow small fruits with success.

June 27th, at the Strawberry Show, the first prize for the be four quarts, was awarded to Horace Eaton, for President Wilde and this was considered one of the handsomest baskets of straw

berries ever exhibited by any member of the Society. There were other baskets of this variety which were very handsome, as also of other varieties. This exhibition was not as large in quantity as some of previous years, but in the size, beauty, and quality of the fruit, it was quite up to the average of past seasons.

July 1st, E. P. Richardson exhibited a very fine collection of strawberries. July 8th, he received the first prize for late strawberries, for La Constante, and the second prize, for Kentucky. He also exhibited a collection of strawberries on the 15th of July.

Seedlings have been exhibited as follows: July 17th, Moore's seedling No. 26. Large, generally conical, but irregular in form; color deep brilliant scarlet, but coloring somewhat irregularly, the tips of some remaining white; flesh white, tinged with red next the outside; hollow at core; flesh firm, quality good. Nos. 27 and 28 correspond so nearly with No. 26 in size, color, and quality, that any other description is considered unnecessary. The Crescent seedling was shown by H. H. Smith, of West Haven, Conn., June 27th. Large; deep, brilliant, glossy scarlet; obtuse conical or wedge shape, with a suture at the apex; flesh, orange scarlet, solid at centre, pretty soft, of rather harsh acid. A truss of fruit showed a disposition to ripen evenly and bring all to good size. June 24th, N. B. White exhibited trusses of eight varieties of seedlings, containing ripe and green fruit. From their appearance we should judge some might be very prolific, but we cannot say much about the quality, as there were but few ripe berries of each variety.

July 22d, Marshall P. Wilder was awarded the Prospective Prize for the best Seedling Strawberry, after a public trial of three years, for his seedling, President Wilder, for its size, beauty, and quality. This seedling was produced in 1861, and put upon the market in August, 1869. It is considered a valuable acquisition, more particularly by amateur growers for home consumption, as its quality is fully equal to any other variety. By some it is said to be an abundant bearer, and it also succeeds well in frames under glass.

CHERRIES.—We have nothing new to report upon in the line of cherries. The old varieties have been shown, in about the same amount and by the same persons as for the past few years. C. E. Grant exhibited Elton, May Bigarreau, Black Tartarian and Black Eagle; Isaac P. Langworthy, Knight's Early Black; B. B. Davis, Black Eagle; C. N. Brackett, Black Bigarrreau; Frank M. Gilley and Charles F. Curtis, Downer's Late. All of these were fine specimens.

J. H. Fenno exhibited his seedling, Norfolk, July 15th, and was awarded the Society's Silver Medal. This seedling is considered a valuable acquisition; it is a late variety, and in quality first rate.

Currants. — The season has been favorable for this fruit, and the crop was good. B. G. Smith exhibited fine specimens of Black Naples, Versaillaise, Dana's White, and Cherry; J. H. Fenno, Red Dutch, Cherry, Dana's White, and Versaillaise; and Amos Bates and Mrs. E. M. Gill, Versaillaise. Many other persons showed the same varieties, and most of the fruit was very fine — much superior to that of last year.

Gooseberries. — We have nothing new to report, in relation to this fruit. July 22d, the first prize was awarded for Downing, and the second for Wellington's Glory. August 5th, the Downing received the first prize for the best native variety, and Bang-up the first prize for foreign. All the above fruit was good, and the Bang-up, exhibited by B. G. Smith, which took the first prize for foreign varieties, was an extra fine basket of fruit, and worthy of particular notice.

Raspberries. — The exhibition of this fruit, this season was much below the average. July 8th, the first prize was awarded to B. G. Smith, for Franconia, and the second to J. H. Fenno, for American Black Cap. July 15th, the first prize for the best collection was awarded for Hornet, Saunders, Herstine, Philadelphia, and American Black Cap, and the first prize for the best two quarts of any variety for Herstine. The above named varieties, comprised all shown, no new kinds having been offered.

Blackberries. — We are sorry to be again obliged to make an unfavorable report on this valuable fruit. The small crop is probably owing to the cold winter of 1874–5, which killed many of the canes and injured others. July 22d, the first prize was given to the Dorchester, and also on July 29th, and August 5th and 12th, showing that this old variety maintains its former reputation for hardiness, and for the size and quality of its fruit.

Plums. — We have no improvement to report of this fruit. August 19th, the first premium was awarded to J. H. Fenno, for Washington. August 26th, the first prize for the best collection was given to Amos Bates, and for the best dish of any variety, to the same, for Green Gage. At the Annual Exhibition, September 19th, the first prize for a collection, was awarded to Horace Eaton and for the best dish to the same, for Reine Claude de Bavay.

NECTARINES. — Of this fruit, the only dish offered was one at the Annual Exhibition, of Rivers' Victoria, grown in the orchard-house, by John Falconer. He was awarded the first prize.

FIGS. — August 19th, the first prize was awarded for Brown Turkey, and the second for Purple Ischia. Figs were also exhibited, August 26th, by J. H. Fenno, and Mrs. S. Joyce.

PEACHES. — Of forced peaches, we have but little to report. May 27th, James Comley exhibited a peach tree in a twelve inch pot, bearing thirty-eight peaches, nearly all well ripened. At the Strawberry Show, June 27th, R. W. Turner exhibited some very fine specimens of George the Fourth and Late Crawford. August 19th, John Falconer made a very fine display of peaches, of orchard-house culture. C. D. Kingman exhibited some very fine Early Crawfords, Arthur W. Felton good specimens of River's Early, and J. L. D. Sullivan a fine dish of Hale's Early. The exhibition of out-door peaches was much inferior to that of last year; none of the premiums for a collection were awarded. The second prize for a single dish was awarded for the Foster peach; the first prize for the best dish of orchard-house culture, to John Falconer, for Lord Palmerston, and the second to John Kelley, for Late Crawford. There have been several new seedlings offered, but none worthy of any particular notice.

APPLES. — The exhibition of this fruit during the season has been very fine — much above the average of past seasons. Almost every year is noted for its superior specimens of some varieties of all kinds of fruit, and this rule applies especially to apples. This season, among early apples, the Sweet Boughs were very fine, and much above the average in size and beauty. The Williams were remarkable for size, beauty, and soundness; it is very seldom we see so many fine dishes of any variety as have been shown of the Williams this year. The Gravenstein is another variety that has been remarkably large, handsome, and sound, and has attracted much attention at all weekly and annual shows. The Garden Royal has also been very fine, and exhibited much more than in former years, and was very welcome, as we consider that it stands in the same position among apples, as the Seckel or Dana's Hovey occupies among Pears. There have been many other varieties shown during the season, that have attracted much attention. February 5th, Benjamin P. Ware, of Marblehead, exhibited a dish of the Pickman Pippin, a very handsome apple, and highly prized for cooking, but

not of value as an eating apple. It commands a good price whe well known, for cooking purposes. April 15th, J. H. Fenno exhibite a dish of Hubbardston Nonsuch, which were sound, but consider ably shrivelled; the flavor was good for so late in the season. Ma 13th, B. G. Smith exhibited a very fine dish of Roxbury Russets, i excellent condition. August 12th, very fine Large Yellow Bough were shown by Warren Heustis, John Fillebrown, B. B. Davis, an others; Williams, by Samuel Hartwell, Asa Clement, and Georg Hill. September 2d, the prizes for the best of any variety, wer awarded as follows: the first for Gravenstein, the second for Found ling, the third for Porter, and the fourth for Garden Royal. Sep tember 9th, the first prize for any other variety than those named was given for Garden Royal, second for Holden Pippin, third fo Summer Pippin.

At the Annual Show, there were no prizes offered for collections as has been the practice in past years, but all prizes were offere for single dishes. In making out the Schedule, the Committe selected all the varieties that were grown to any extent, an offered prizes for thirty-eight different kinds, proportioning th number of prizes to the value of the variety for all purposes ac cording to their best judgment, — to the best and most valuable four prizes, and to those of the least value, two prizes. The Com mittee are aware that this was a great change, but believe it was fo the best interests of the Society, and also of the exhibitor, an think that it has given general satisfaction. The following is th number of dishes of the different varieties, at the Annual Exhib tion:

Alexander,	1	Golden Russet,	
American Beauty,	1	Gravenstein,	1
Baldwin,	13	Holden Pippin,	
Blue Pearmain,	4	Hubbardston,	2
Cogswell,	2	Hunt Russet,	
Danvers Winter Sweet,	6	King of Tompkins County,	
Duchess of Oldenburg,	3	Ladies' Sweet,	
Dutch Codlin,	2	Lyscom,	
Esopus Spitzenburg,	1	Maiden's Blush,	
Fall Pippin,	1	Minister,	
Fameuse,	3	Mother,	
Foundling,	5	Northern Spy,	
Garden Royal,	1	Orange Sweet,	

Porter, ...	11	Sudbury Sweet, . .	2
Pumpkin Sweet, . .	3	Twenty Ounce, . . .	1
R. I. Greening, . .	11	Washington Strawberry, .	2
Roxbury Russet, . .	13	Yellow Bellflower, . .	3

Dr. Charles C. Hamilton, of Cornwallis, Nova Scotia, a Corresponding Member of the Society, desirous of promoting its interests, forwarded a collection of thirty-two varieties of apples, which were exhibited on the 16th of December. Perhaps the finest specimens were the Broadwell, a sweet apple, of excellent quality, originated in Ohio, which deserves to be tested here. The Baldwins, though not large, were the highest colored we have ever seen. The Gravensteins also were not large, but were handsome and in excellent preservation. This is not the first time that Dr. Hamilton has laid the Society under obligation for a similar favor.

On the day last mentioned, O. B. Hadwen, of Worcester, exhibited several apples more generally grown in Worcester county than in the eastern part of the State, but which appear deserving of more extensive trial, first of which we would mention the Washington Royal or Palmer Greening—a handsome yellow apple of medium size and the highest quality, both for table and cooking. The tree is of vigorous growth and good habit, and bears annual crops. It originated on the farm of Joseph P. Hayward, in Sterling. The Leicester Winter Sweet is of large size, yellow, and fine for table or baking. Baylies' Winter Sweet is of medium size, striped with purplish crimson, and has much saccharine matter. Excel is a Connecticut apple of medium size, somewhat conical in form, skin yellow but nearly covered with bright red; juicy, and of brisk but pleasant subacid flavor. McClellan is of medium size, flattened, striped with red, of mild subacid flavor, and thought by the Committee to be one of the best of the collection. We have several times during the season been indebted to Mr. Hadwen for interesting exhibitions of apples, and we wish that more of the apple growers in central and western Massachusetts, where that fruit flourishes better than on the seacoast, might be induced to follow his example.

August 19th, C. F. Gerry, of Dorchester, exhibited a seedling, which he has named Gerry's Sweeting; medium size, round, slightly pearmain shaped, a little angular in transverse section; skin dull greenish yellow, striped with pinkish red, which, towards the sun, is continuous, excepting that it is dotted with white; juicy, sweet; good to very good. This seedling resembles Sweet Romanite,

described at page 377, of "Downing's Fruits and Fruit Trees of America." September 19th, H. A. Lothrop, of Sharon, exhibited the following named seedlings: No. 1.—Large, greenish yellow, striped with red; a bright red cheek next the sun, not unlike the Hubbardston Nonsuch in its general appearance. No. 2.—Medium size; pearmain shape; bright red; quite a handsome apple. No. 3.—Large, greenish, striped with red; very much like No. 1. No. 4.—Large, greenish yellow; not unlike Gloria Mundi. No. 5.—Small, green, sweet; claimed to be a very valuable variety, owing to its keeping until late in winter or spring, and to be very good for baking. These varieties all appear to be very late, none of them being in condition to test their qualities for eating. They are all said to be chance seedlings, springing up near a cider mill, and from cider apples.

Pears.—The season has been very favorable for this fruit, and the exhibitions during the season have been superior to the average of the last few years. The change in the offers of prizes, from collections to single dishes, as spoken of in apples, has been applied to pears; and we think it a great improvement, as the dishes of each variety are arranged together, and if a person comes to get any information in relation to any particular variety, he can see for himself how it succeeds in Cambridge, Worcester, Concord, Revere, or any other part of the State, and judge what variety will do best in his location. Another reason for the change is that it gives the Committee a better opportunity to judge correctly of the different varieties. As remarked in connection with apples, so also with pears — different seasons suit different varieties. Last year the Beurre Hardy was remarkably large and handsome; this season the Beurre Bosc and Beurre d'Anjou show the most marked increase, in size and beauty, over other varieties.

January 22d, J. H. Fenno exhibited fine dishes of Beurre Langelier, Easter Beurre, and Josephine de Malines; John L. Bird, Winter Nelis, and Charles Bird, extra fine Beurre d'Anjou. March 11th, Aaron D. Capen showed Beurre d'Aremberg, and J. H. Fenno, Josephine de Malines, and on the 18th, Aaron D. Capen, Winter Nelis. April 1st, F. & L. Clapp showed their seedling No. 2. This is a very handsome pear, not first rate in quality, but will be valuable for its beauty and late keeping. April 15th, J. H. Fenno brought very fine Easter Beurres, and on the 22d, F. & L. Clapp their seedling No. 64. The specimens of this

variety were not quite equal to those shown in 1875, but were very handsome, and of better quality than No. 2.

July 29th, Doyenne d'Eté pears were shown by J. H. Fenno, Warren Heustis, Frank M. Gilley, and B. G. Smith. August 5th, Warren Heustis, W. S. Janvrin, and John McClure had fine specimens of Beurre Giffard. August 12th, the first prize for any other variety than Beurre Giffard, was awarded for Suprême de Quimper. August 19th was premium day for Clapp's Favorite; and this was one of the best weekly exhibitions during the year. The season was suited to this variety, and the display, not only on this, but on other days, was remarkably fine. August 26th, being prize day for Bartlett and several other varieties, we had a very fine exhibition. The competition on Bartlett was very spirited, and some of the dishes shown were very large and handsome. The first prize was awarded to John McClure, and the first premium for any other variety than those specified, was given to Hovey & Co., for Omer Pasha. September 2d was another premium day for Bartlett, and the competition was again very large. The first prize was awarded to John McClure; the first prize for any other variety, to B. G. Smith, for Duchesse de Berri, and the second to R. Manning, for Ott. September 9th, fine specimens of Andrews pears were shown by C. N. Brackett, John L. Bird, and C. E. Grant, and of Doyenne Boussock by E. W. Wood, Hovey & Co., and Charles Bird. The first prize for any other variety than these or Flemish Beauty was given for Belle Lucrative.

The display of pears at the Annual Exhibition was not as large as on some former occasions, but we think that, considering the quality of all the fruit on exhibition, it was one of the best, if not the best ever made by this Society. The new rule of offering prizes only for single dishes, is probably one reason for there being so little inferior fruit. The most remarkable pears at this exhibition were the Beurre Bosc and Beurre d'Anjou of W. R. Austin, the former weighing nine pounds, seven and three-quarters ounces. Mr. Austin's Duchesse d'Angoulemes weighed eleven pounds, three and one-half ounces. The Beurre Hardy of C. F. Curtis were very fine, but not so large as some shown last year. There were many other very fine specimens of different varieties; but it would require too much space to mention them all. Premiums were offered for forty different varieties, and the following are the number of dishes shown of each:

Adams,	1	Fulton	
Andrews,	8	Glout Morceau,	
Bartlett,	23	Goodale,	
Belle Lucrative,	22	Howell,	1
Beurre d'Anjou,	26	Lawrence,	1
Beurre Bosc,	26	Louise Bonne of Jersey,	2
Beurre Clairgeau,	11	Marie Louise,	
Beurre Diel,	9	Merriam,	1
Beurre Gris d'Hiver Nouveau,	8	Mount Vernon,	
Beurre Hardy,	10	Paradis d'Automne,	
Beurre Langelier,	11	Pratt,	
Beurre Superfin,	14	Seckel,	2
Buffum,	9	Sheldon,	2
Caen du France,	4	Souvenir du Congrès,	
Dana's Hovey,	13	St. Michael Archangel,	
De Tongres,	9	Swan's Orange,	1
Doyenne Boussock,	13	Urbaniste,	1
Doyenne du Comice,	8	Vicar of Winkfield,	1
Duchesse d'Angouleme,	16	Winter Nelis,	1
Flemish Beauty,	6		

At the show on the 7th of October, the varieties worthy of pa ticular notice were the same as at the Annual Exhibition. Th dish of Beurre Bosc of S. C. Perkins, we think was the largest an handsomest of this variety ever on exhibition. They were ver uniform in shape and size, and of fine russet color, and we believ we are justified in saying it was a perfect dish of pears. The weigh was ten pounds and two ounces. The Beurre Boscs of W. R. Aus tin were also very handsome, and the Beurre Diels of T. M. Davi were very good, as were most of the pears at this exhibition.

October 28th, F. & L. Clapp exhibited their seedling, Frederic Clapp, which has been mentioned several times in previous report as No. 22. It still maintains its reputation for its quality, which first rate. The specimens were not quite as large as some show two years ago, but were very good. Messrs. Clapp also exhibite No. 17, or Nicholas, which is likewise a very fine pear. At th exhibition of November 11th, the most worthy of note were a ver fine dish of Beurre d'Anjou from W. R. Austin, Dana's Hovey fro Hovey & Co., Lawrence from J. H. Fenno, and Winter Nelis fro John L. Bird.

Through the kindness of Marshall P. Wilder we were favore

with an opportunity to test two seedlings raised by B. S. Fox of San Jose, Cal., some of whose seedlings were noticed in our last report. The Wilder is large, oblong ovate pyriform; dull, greenish yellow, with greenish dots and tracings of russet; very sweet and rich. Barry is larger than the preceding, irregular oblong pyriform, resembling an obtuse Vicar of Winkfield, with a suture, and the eye towards one side, as often found in that variety; skin orange yellow, nearly covered with russet in large patches and rich tracings; flesh exceedingly melting and juicy and very sweet and rich, but without high flavor. Both of these varieties were tested the latter part of December. It is noticed that our finest pears when cultivated in California lose the flavor which distinguishes them here, but gain in sweetness, and it will be of much interest to ascertain whether these very sweet varieties, of California origin, will acquire flavor when grown here.

Native Grapes.—The season has been very favorable for this fruit, and the exhibitions have been very good. September 2d, good specimens of Moore's Early, Israella, and Hartford Prolific were shown. The first prize was awarded for Moore's Early. September 9th, Moore's Early, Norwood, Norfolk Muscat, and Delaware, were the four varieties receiving the prizes, and in the order named.

At the Annual Show nearly all of the premiums were awarded, and most of the fruit was above the average of the last few years. The dish most worthy of special notice, was the Concord shown by Nathan Blanchard. The bunches were very large, well shouldered; berries of good size, well ripened, and covered with a heavy bloom. The Committee unanimously, and with much pleasure, awarded to this dish the first prize for the best Concord. At this exhibition the first prize for "any other variety" was awarded for Moore's Early. The exhibition of late varieties, on the 7th of October, was very good—much better than the previous year. On this day, Nathan Blanchard again exhibited some of his extra fine Concords, and received the first prize; the six bunches on this day weighed six pounds and four ounces, and were equal in all respects to those shown at the Annual Exhibition. Mr. Blanchard said that last year he picked from twenty-five to thirty pounds from one vine, and that weight in twenty bunches; but this season the bunches were smaller in consequence of the early freeze, and consequent unripeness of the wood and buds, of the autumn of 1875. The bunches

that we have described above, he calls small bunches. We hope to have the pleasure next season of reporting on some of his large bunches.

The most remarkable collection of seedlings ever shown at any of the exhibitions of this Society, was by James H. Ricketts, of Newburgh, N. Y., at the Annual Exhibition. It consisted of sixty-five varieties, of different colors, that would rank from good to very good, and quite a number that must be called first rate, in quality. The most remarkable thing connected with this collection, and the most difficult to be explained, was that many of the varieties are from seed of the Clinton, which is a small berry, and generally makes but a small bunch, yet most of these seedlings have large bunches and berries. It is true that they are all hybrids, and the parentage on the opposite side might have been from larger fruit. The Committee tested nearly all of the different varieties, and made notes of most of them, as to quality, color, and size of bunch and berry which it may at some time be thought best to publish, but they desire at present to be cautious, and not to mislead the public in relation to this fine collection. The probabilities are that most of the varieties would not do as well with us as where they were raised and Mr. Ricketts concurs in this opinion; but it is to be hoped that some of them may prove hardy and suited to our climate.

N. B. White, exhibited the following named varieties of seedlings: August Giant. — Small bunch, large berry, thick skin, hard pulp, quality fair. Norfolk Muscat. — Medium sized bunch and berry; chestnut color; flavor of the Frontignan, quality good. Black Madeira and Amber Queen have been spoken of in previous reports. No. 6.—Good sized bunch and berry, of fair quality; exhibited October 7th.

September 2d, E. W. Bull had in his collection of seedlings, the following: No. 51. — Large sized bunch and berry, color black. No. 4. — Good sized bunch and berry; color black. Rosalie has been described in previous reports. Nos. 1 and 3 were both black with good sized bunch and berry. No. 27. — Medium sized bunch and berry. None of these were ripe enough to give an opinion as to quality.

October 7th, J. B. Moore exhibited his Seedling No. 31, a white grape, with medium sized bunch and berry, and quality first rate. It has been spoken of in previous reports with much favor, and we have no reason to change our first impressions. We think it may prove a valuable variety.

GRAPES. — We regret very much not being able to re-
unches of Black Hamburg and other varieties at our ex-
s have been shown in England. We have read of bunches
enty-five pounds or more, and here, for the last two years
fered a premium for the largest bunch, not less than five
weight, and have not had an opportunity to award it.
ual Exhibition, the display was as good as the average of
years. C. M. Atkinson had in his collection, some very
es. E. H. Luke also had a fine collection of forced
nd his fruit was well ripened, and the bunches were very
but not large. E. W. Wood, and B. G. Smith's col-
ntained some very fine fruit. E. W. Wood received the
mium offered by Peter Smith, for the largest and hand-
nch of black grapes, for Black Hamburg, and for the
handsomest white grape, for Golden Hamburg.

, ETC.—January 29th, superior oranges were exhibited
Chadwick, of San Mateo, Putnam County, Florida.
as raised on trees of seven years' growth, which came
g the sixth year. The yield of two hundred and fifty
ixth year, was twenty-three barrels; the seventh year,
d and fifteen barrels. The weight of twelve oranges
l a half pounds. March 4th, C. M. Atkinson exhibited
d lemons. March 25th, John Cummings showed very
mens of bananas, well ripened, and of good flavor.
first fruit ever shown, by any member of this Society,
own in this State. C. D. Kingman exhibited oranges on
ay. June 3d, J. Fisk Allen showed a very handsome
nges, part of which were grown on a tree that has been
forty years.

ation of Joseph H. Fenno, the Committee visited his
ice during the season. On the first visit, June 14th,
was found in good order, everything about it being
ell cared for; the fruit was well set, the trees were all
l in fine condition. One particular feature was, his
e trees well headed in. The orchard contains about
; the trees are set in rows, thirty feet apart, and fifteen
rows. Mr. Fenno has a heavy clay sub-soil, well under-
He said he never used any manure or fertilizer, excepting
; and thought that by this method he got less growth of
more and better fruit. Your Committee could hardly

agree with him on this point, but believed that the trees would b much benefited and improved in their thriftiness, and in the siz and quantity of fruit, if he should use a liberal amount of manure On their second visit, the last of August, the Committee found th trees well loaded with fine fruit, and many of the varieties ripe giving them an opportunity of testing them, which they did no refuse. The grounds on this visit, as well as on the first one, were in fine condition, free from weeds, and in first-rate order. Beside tree fruits, Mr. Fenno raises many small fruits with success, such a currants, strawberries, raspberries, and gooseberries; they were al in fine order.

The Fruit Committee wish to express their thanks to Peter Smith for his liberal donation of fifty dollars, for premiums, to be awarded for fruits, flowers, and vegetables. The amount of twenty dollars was allotted to this Committee, which was all awarded for objects of merit.

At the Annual Exhibition, the number of dishes of Pears exhibited was 565

Number of dishes of Apples, . . . 258

" " Foreign Grapes, . . 44

" " Native " . . 79

Rickett's Seedling Grapes, ... 65

Making in all, 1,011 dishes, of all varieties of fruit.

Premiums and Gratuities have been awarded to one hundred and fifty-three different persons. Last year the number was one hundred and forty. The annexed list of awards, shows the amount of prizes to be, $1,473; gratuities, $527; total, $2,000; balance unexpended, $100. Included in the above mentioned amount o premiums is the Prospective Prize of $50, awarded to Marshall P Wilder, for his Seedling Strawberry, President Wilder.

All of which is respectfully submitted.

HERVEY DAVIS,
P. B. HOVEY,
BENJ. G. SMITH,
JOHN B. MOORE,
E. W. WOOD,

Fruit Committee.

ND GRATUITIES AWARDED FOR FRUITS.

January 22.

s. — For the best Beurre Langelier, to J. H.
. . . . . $2 00
Easter Beurre, to J. H. Fenno, . . 2 00
t Josephine de Malines, to J. H. Fenno, . 2 00
t Vicar of Winkfield, to J. L. Bird, . . 2 00
econd best, to J. H. Fenno, . . . 1 00
Winter Nelis, to J. L. Bird, . . . 2 00
econd best, to C. E. Grant, . . . 1 00
st cooking pears of any variety, to J. H.
for Uvedale's St. Germain, . . . 2 00
econd best, to C. E. Grant, for Catillac, . 1 00

:—

no, for collection of Apples, . . . 3 00
rd, for very fine Beurre d'Anjou Pears, . 3 00
no, for collection of Pears, . . . 3 00
nt, " " " " 3 00

January 29.

—

adwick, San Mateo, Florida, for superior
s, ... 3 00

February 5.

—

P. Ware, for Pickman Pippin Apples, . 2 00

March 4.

:—

e, for Strawberries, ... 1 00
inson, for Lemons and Oranges, . . 2 00

MARCH 11.

Gratuities: —

To Aaron D. Capen, for Beurre d'Aremberg Pears, . $2 0
Joseph H. Fenno, for Josephine de Malines Pears, . 2 0

MARCH 18.

Gratuity: —

To Aaron D. Capen, for Winter Nelis Pears, . 1 0

MARCH 25.

Gratuities: —

To John Cummings, for Bananas, ... 3 0
C. D. Kingman, for Oranges, ... 2 0
George Cruickshanks, for Strawberries, . . . 1 0
Enoch Pillsbury, for Roxbury Russet Apples, . . 1 0

APRIL 1.

Gratuity: —

To F. & L. Clapp, for Seedling Pear, No. 2, . . . 3 0

APRIL 15.

Gratuity: —

To J. H. Fenno, for Pears and Apples, ... 3 0

APRIL 22.

Gratuity: —

To F. & L. Clapp, for Seedling Pear, No. 64, . . 3 0

MAY 13.

Gratuity: —

To B. G. Smith, for very fine Roxbury Russet Apples, . 1 0

MAY 27.

Gratuities: —

To Charles Garfield, for Strawberries, ... 1 0
James Comley, for Peach Tree in twelve-inch pot, with thirty-eight Peaches, ... 5 0

JUNE 3.

— Third prize, for a quart grown in frames
lass, to Charles Garfield, ... $3 00

—

Allen, for a very handsome dish of Oranges, 5 00

JUNE 10.

:—

P. Wilder, for President Wilder Strawber-
. . . . . 2 00
rfield, for Triomphe de Gand Strawberries, 3 00

JUNE 17.

:—

oore, for Jenny Lind Strawberries, . . 3 00
h, " " " " . . 2 00
Fenno, for Brighton Pine Strawberries, . 2 00
rfield, for Triomphe de Gand Strawberries, 3 00
t, " " " " . 2 00

ROSE SHOW.

JUNE 21.

BERRIES.— For the best four quarts, to John
re, for Gen. Sherman, ... $8 00
cond best, to Charles Garfield, for Triomphe
d, ... 6 00
ird best, to John B. Moore, for Grace, . 4 00
t two quarts, to William C. Child, for
, ... 4 00
econd best, to J. B. Moore, for Hovey's
, ... 3 00
hird best, to Hovey & Co., for Champion, 2 00

:—

ley, for Peaches, ... 3 00
ker, for Figs, ... 2 00
h, for Strawberries, ... 2 00
e, for Seedling Strawberries, . . . 3 00

JUNE 24.

Gratuities: —

To Charles Garfield, for Strawberries,	$2 00
Benj. G. Smith, " "	4 00
C. E. Grant, " "	1 00

STRAWBERRY SHOW.

JUNE 27.

STRAWBERRIES. — For the best four quarts, to Horace Eaton, for President Wilder,	$15 00
For the second best, to John B. Moore, for Caroline,	10 00
For the third best, to John B. Moore, for President Wilder,	5 00
For the best two quarts of Agriculturist, to H. C. Bowers,	4 00
For the best Caroline, to John B. Moore,	4 00
For the best Champion, to John C. Park,	3 00
For the second best, to Hovey & Co.,	2 00
For the best Charles Downing, to Warren Heustis,	3 00
For the second best, to Aaron D. Capen,	2 00
For the best Col. Cheney, to Warren Heustis,	4 00
For the best Hovey's Seedling, to John B. Moore,	4 00
For the second best, to Hovey & Co.,	3 00
For the third best, to B. G. Smith,	2 00
For the best Jucunda, to Charles W. Shepard,	4 00
For the second best, to Charles Garfield,	3 00
For the third best, to B. G. Smith,	2 00
For the best Lady of the Lake, to John B. Moore,	3 00
For the second best, to B. G. Smith,	00
For the best Late Prolific, to John B. Moore,	3 00
For the second best, to Hovey & Co.,	2 00
For the best President Wilder, to George N. Noyes,	4 00
For the second best, to John B. Moore,	3 00
For the third best, to Marshall P. Wilder,	2 00
For the best Seth Boyden, to John C. Park,	3 00
For the second best, to John B. Moore,	2 00
For the best Wilson, to G. W. Pierce,	4 00

For the best four varieties, to C. E. Grant, n, Napoleon Bigarreau, Black Tartarian and Eagle, ... $6 00

two quarts, to Isaac P. Langworthy, for s Early Black, ... 4 00

econd best, to C. E. Grant, for Black Tar- 3 00

hird best, to Benjamin B. Davis, for Black 2 00

or the best twelve specimens, to R. W. for George the Fourth, ... 8 00

econd best, to R. W. Turner, for Crawford's 6 00

:—

Gilley, for collection of Cherries, . . 2 00

Davis, for Elton Cherries, ... 1 00

ton, for Monarch of the West Strawberries, 1 00

th, for Crescent Seedling Strawberries, . 2 00

Newhall, for Jucunda Strawberries, . . 2 00

er, for Kentucky Strawberries, . . . 1 00

rce, for collection of Strawberries, . . 4 00

ston, for Seedling Strawberries, . . 1 00

oore, for collection of Seedling Strawberries, 5 00

te, " " " " . 2 00

JULY 1.

:—

ardson, for collection of Strawberries, . 3 00

Moore, for a very fine collection of Straw- 10 00

Noyes, for Strawberries, ... 1 00

rce, for Cherries, ... 2 00

nt, for Black Eagle Cherries, . . . 2 00

JULY 8.

For the best two quarts, to C. N. Brackett, ck Bigarreau, ... 4 00

second best, to Frank M. Gilley, for r's Late, ... 3 00

ird best, to C. F. Curtis, for Downer's Late, 2 00

RASPBERRIES. — For the best two quarts, to B. G. Smith, for Franconia, ... $4
For the second best, to J. H. Fenno, for American Black Cap, ... 3
For the third best, to B. G. Smith, for American White, ... 2

STRAWBERRIES. — For the best two quarts, to E. P. Richardson, for La Constante, ... 4
For the second best, to E. P. Richardson, for Kentucky, ... 3
For the third best, to John B. Moore, for Belle, . 2

Gratuities: —

To William C. Child, for collection, ... 1
C. E. Grant, for Currants and Cherries, . . . 3
Frank M. Gilley, for Cherries, ... 1
W. K. Wood, for Currants, ... 3
J. H. Fenno, " " 2
B. G. Smith, " " 3
G. M. Mellen, " " 1
Mrs. E. M. Gill, for Grapes and Raspberries, . . 3
Benj. B. Davis, for Gooseberries, ... 2

JULY 15.

CURRANTS. — For the best four quarts of Red, to Amos Bates, for La Versaillaise, ... 4
For the second best, to B. G. Smith, for La Versaillaise, ... 3
For the third best, to C. M. Atkinson, for La Versaillaise, ... 2
For the best four quarts of White, to J. H. Fenno, for Dana's White, ... 3
For the second best, to Frederick Gould, for Dana's White, ... 2

RASPBERRIES. — For the best collection, to Joseph H. Fenno, for Hornet, Saunders, Herstine, Philadelphia, and American Black, ... 5
For the second best, to John B. Moore, for Hornet, Herstine, Clarke, and Saunders, ... 3

st two quarts, to Joseph H. Fenno, for Her-
. . . . . $4 00
second best, to John B. Moore, for Hornet, 3 00
third best, to John B. Moore, for Saunders, 2 00

es: —

arfield, for collection, ... 2 00
Fenno, " " 2 00
I. Mitchell, for Currants, ... 1 00
n, " " 1 00
. Pierce, " " 1 00
gent, " " 1 00
es, " " 1 00
ith, " " 1 00
nt, for Currants and Raspberries, . . 2 00
hardson, for Strawberries and Raspberries, . 2 00
anning, for Cherries, ... 1 00

JULY 22.

For the best collection, to B. G. Smith, for
Naples, Versaillaise, Dana's New White,
herry, ... 5 00
second best, to J. H. Fenno, for Red Dutch,
, Dana's White and Versaillaise, . . 3 00
t two quarts, to Amos Bates, for Versaillaise, 4 00
second best, to B. G. Smith, for Versaillaise, 3 00
third best, to Mrs. E. M. Gill, for Versail-
. . . . . 2 00
s. — For the best two quarts, to Benjamin B.
, for Dorchester, ... 4 00
s. — For the best two quarts, to Horace
for Downing, ... 4 00
cond best, to B. G. Smith, for Wellington's
. . . . . 3 00
hird best, to B. G. Smith, for Smith's Seed-
. . . . . 2 00

es: —

I. Gill, for collection, ... 2 00
Fenno, " " 3 00
Moore, " " 3 00

JULY 29.

BLACKBERRIES.—For the best two quarts, to James Nugent, for Dorchester,	$3 0
For the second best, to Benj. B. Davis, for Dorchester,	2 0
PEARS.—For the best Doyenne d' Eté, to Joseph H. Fenno,	4 0
For the second best, to Warren Heustis	3 0
For the third best, to Frank M. Gilley,	2 0
For the fourth best, to Benj. G. Smith,	1 0

Gratuities:—

To Charles Garfield, for Gooseberries and Blackberries,	2 0
H. M. Wiswall, for Blackberries,	1 0
G. F. Waters, " "	1 0
Benj. G. Smith, for Gooseberries,	1 0
Joseph H. Fenno, for Apples, Pears, and Raspberries,	2 0
Benj. B. Davis, for Large Yellow Bough Apples,	1 0
N. B. White, for Red Astrachan Apples,	1 0
C. N. Brackett, for collection of Apples (July Pearmain, Summer Rose, and Red Astrachan),	2 0
E. W. Wood, for Apples,	1 0
A. S. M'Intosh, for Doyenne d' Eté Pears,	1 0
Mrs. E. M. Gill, for collection,	2 0

AUGUST 5.

PEARS.—For the best Beurre Giffard, to Warren Heustis,	3 0
For the second best, to W. S. Janvrin,	2 0
For the third best, to John McClure,	1 0
For the best Bloodgood, to T. M. Davis,	3 0
For the second best, to Asa Clement,	2 0
For the best Doyenne d' Eté, to Joseph H. Fenno,	3 0
For the best Madeleine, to J. S. Richards,	2 0
For the second best, to Joseph H. Fenno,	1 0
APPLES.—For the best Large Yellow Bough, to B. B. Davis,	3 0
For the second best, to Warren Heustis,	2 0
For the best Williams, to Samuel Hartwell,	3 0
For the second best, to Asa Clement,	2 0

.—For the best, to James Nugent, for Dor-
, ... $4 00
econd best, to Josiah Crosby, for Kittatinny, 3 00
hird best, to G. F. Waters, for Kittatinny, 2 00
ourth best, to C. Garfield, for Kittatinny, . 1 00
.—For the best two quarts of Native, to B.
th, for Downing, ... 3 00
second best, to Joseph H. Fenno, for
ton's Seedling, ... 2 00
t two quarts of Foreign, to B. G. Smith,
ng-up, ... 3 00
econd best, to C. Garfield, for Crown Bob, 2 00

:—

ite, for Apples, ... 2 00
Gilley, for Apples, ... 1 00
tcher, for collection of Apples, . . . 1 00
rtwell, for Red Astrachan Apples, . . 1 00
nley, " " " " . . 1 00
nt, " Early Harvest Apples, . . 1 00
loore, for Apples and Raspberries, . . 2 00
ckett, " " " Pears, . . . 1 00
swall, " Large Yellow Bough Apples and
erries, ... 2 00
yes, for Apples, Gooseberries, and Black-
. . . . . 2 00
rd, for Beurre Giffard Pears, . . . 1 00
Smith, for Pears, ... 1 00
. Gill, for Gooseberries, ... 1 00
es, for collection, ... 2 00

AUGUST 12.

the best Early Harvest, to J. H. Fenno, . 3 00
econd best, to Asa Clement, . . . 2 00
t Large Yellow Bough, to Warren Heustis, . 4 00
econd best, to John Fillebrown, . . 2 00
hird best, to Benj. B. Davis, . . . 1 00
t Red Astrachan, to Warren Heustis, . 3 00
econd best, to Edwin Fletcher, . . . 2 00
hird best, to Frank M. Gilley, . . . 1 00

For the best Williams, to Samuel Hartwell,	$3 00
For the second best, to Asa Clement,	2 00
For the third best, to George Hill,	1 00
For the best of any other variety, to Joseph H. Fenno, for American Summer Pearmain,	3 00
For the second best, to Asa Clement, for Early Joe,	2 00
For the third best, to T. M. Davis, for Summer Harvey,	1 00
PEARS.—For the best Beurre Giffard, to Charles Bird,	3 00
For the second best, to Warren Heustis,	2 00
For the third best, to W. S. Janvrin,	1 00
For the best of any other variety, to Hovey & Co., for Suprême de Quimper,	3 00
For the second best, to J. McClure, for Osband's Summer,	2 00
For the third best, to Hovey & Co., for Manning's Elizabeth,	1 00
BLACKBERRIES.—For the best, to James Nugent, for Dorchester,	4 00
For the second best, to Charles Garfield, for Kittatinny,	3 00

Gratuities:—

To Edwin Fletcher, for Williams Apples,	1 00
Lewis Slack, for Large Yellow Bough Apples,	1 00
N. B. White, for Red Astrachan Apples,	1 00
C. N. Brackett, for Williams and River Apples,	1 00
G. N. Noyes, for collection of Apples,	1 00
Joseph H. Fenno, for Apples,	1 00
John B. Moore, for collection of Apples and Raspberries,	2 00
J. T. Foster, for Apples and Peaches,	1 00
Charles Bird, for Beurre Giffard Pears,	1 00
J. McClure, " " " "	1 00
Mrs. E. M. Gill, for Foreign Grapes and Pears,	2 00
C. D. Kingman, for Foreign Grapes and Peaches,	3 00
Mrs. Benjamin Fobes, for Figs,	1 00
Charles Garfield, for Franconia Raspberries,	1 00

AUGUST 19.

the best dish, to Joseph H. Fenno, for Wash-	
. . . . .	$3 00
econd best, to Amos Bates, for Green Gage,	2 00
hird best, to Amos Bates, for Smith's Or-	
. . . . .	1 00
the best Clapp's Favorite, to F. & L. Clapp,	4 00
econd best, to Joseph H. Fenno, . .	3 00
hird best, to John Fillebrown, . . .	2 00
ourth best, to Horace Eaton, . . .	1 00
t of any other variety, to Charles Bird, for	
rn's Seedling, ...	4 00
econd best, to C. N. Brackett, for Brandy-	
. . . . .	3 00
hird best, to Hovey & Co., for Brandywine,	2 00
ourth best, to J. H. Fenno, for Rostiezer, .	1 00
r the best of cold house or pot culture, to	
Kingman, for Early Crawford, . . .	5 00
econd best, to John Falconer, for Rivers'	
. . . . .	4 00
hird best, to Arthur W. Felton, for Rivers'	
. . . . .	3 00
e best, to Mrs. Benjamin Fobes, for Brown	
, ...	3 00
second best, to T. W. Walker, for Purple	
. . . . .	2 00

s: —

ry, for new Seedling Apple, Gerry's Sweet-	
. . . . .	1 00
ite, for Red Astrachan Apples, . . .	1 00
ssell, for Williams Apples, . . .	1 00
eustis, " " " . . .	1 00
rown, " " " . . .	1 00
nings, " " " . . .	1 00
tcher, for collection of Apples, . . .	2 00
rtwell " " " . . .	2 00
Fenno, for Apples, ...	1 00
Eaton, " "	1 00

To John B. Moore, for Apples and Pears, . . . $2
C. N. Brackett, " " " 3
D. B. Flint, " " " 1
Warren Heustis, for Clapp's Favorite Pears, . . 1
C. F. Curtis, " " " " . . 1
J. McClure, for Pears, ... 1
C. E. Grant, " " 1
J. L. D. Sullivan, for Hale's Early Peaches, . . 2
John Falconer, for Peaches, Pears, and Plums, . . 5
C. D. Kingman, for Foreign Grapes, . . . 3
John B. Moore, for Moore's Early Grapes, . . 2
James Nugent, for Dorchester Blackberries and Pears, 1

AUGUST 26.

PEARS.—For the best Bartlett, to John McClure, . . 4
For the second best, to Charles F. Curtis, . . 3
For the third best, to Horace Eaton, . . . 2
For the fourth best, to Hovey & Co., . . . 1
For the best Manning's Elizabeth, to Joseph H. Fenno, 3
For the second best, to Hovey & Co., . . . 2
For the best Pinneo, or Boston, to Hovey & Co., . . 3
For the second best, to J. H. Fenno, . . . 2
For the best Rostiezer, to M. W. Chadbourne, . . 3
For the second best, to G. M. Mellen, . . . 2
For the third best, to Joseph H. Fenno, . . . 1
For the best Tyson, to A. S. M'Intosh, . . . 3
For the second best, to Charles Bird, . . . 2
For the third best, to Joseph H. Fenno, . . . 1
For the best of any other variety, to Hovey & Co., for Omer Pasha, ... 3
For the second best, to John Cummings, for Brandywine, ... 2
For the third best, to Hovey & Co., for Sterling, . 1
PLUMS.—For the best collection, to Amos Bates, . . 4
For the second best, to Horace Eaton, . . . 3
For the best dish, to Amos Bates, for Green Gage, . 3
For the second best, to H. M. Wiswall, for Bradshaw, ... 2
For the third best, to Amos Bates, for Smith's Orleans, ... 1

the best dish of Peaches, to J. A. J. Wil-	
Seedling, ...	$4 00
cond best, to J. T. Foster, for Laura, .	3 00
—	
Gill, for Clapp's Favorite Pears, . .	1 00
" " " " . .	1 00
pp, " " " " . .	1 00
l, " " " " . .	1 00
rown, " " " " . .	1 00
ce, for Pears and Figs, ...	1 00
d, for Pears and Apples, . . .	1 00
ings, for Apples and Pears, . . .	3 00
kett " " " . . .	1 00
, for Williams Apples, ...	1 00
en, for Duchess of Oldenburg Apples, .	1 00
Fenno, for Apples and Figs, . . .	2 00
cher, for collection of Apples, . . .	2 00
twell " " " . . .	1 00
ft, for collection of Crab Apples, . .	1 00
man, for Grapes and Peaches, . . .	2 00

SEPTEMBER 2.

the best of any variety, to Samuel Hart-	
Gravenstein, ...	4 00
ond best, to Edwin Fletcher, for Foundling,	3 00
hird best, to John Cummings, for Porter,	2 00
ourth best, to Edwin Fletcher, for Garden	
. . . . .	1 00
he best Bartlett, to J. McClure, . .	4 00
cond best, to W. S. Janvrin, . . .	3 00
ird best, to Hovey & Co., . . .	2 00
urth best, to Charles Bird, . . .	1 00
of any other variety, to Benjamin G. Smith,	
hesse de Berri, ...	4 00
cond best, to R. Manning, for Ott, . .	3 00
ird best, to Hovey & Co., for Wheeler, .	2 00
urth best, to Hovey & Co., for Hannas, .	1 00
s. — For the best of any variety, to John	
re, for Moore's Early, ...	4 00

For the second best, to John B. Moore, for Hartford Prolific,	$3 00
For the third best, to Eben Snow, for Israella,	2 00
For the fourth best, to Eben Snow, for Hartford Prolific,	1 00

Gratuities: —

To Edwin Fletcher, for Apples,	1 00
M. W. Chadbourne, for Apples and Pears,	1 00
Warren Heustis, " " "	1 00
John Cummings, for collection of Apples and Pears,	3 00
G. N. Noyes, " " " "	1 00
C. N. Brackett, " " " "	1 00
O. B. Hadwen, " Pears and Apples,	2 00
J. S. Richards, " collection of Pears,	1 00
C. E. Grant, for Pears and Foreign Grapes,	1 00
George W. Stevens, for Crawford's Early Peaches,	2 00
H. W. Wilson, for Stump the World Peaches,	1 00
B. G. Smith, for collection,	1 00
C. D. Kingman, for Peaches and Foreign Grapes,	3 00

SEPTEMBER 9.

APPLES. — For the best Foundling, to Samuel Hartwell,	3 00
For the second best, to Edwin Fletcher,	2 00
For the third best, to Asa Clement,	1 00
For the best Gravenstein, to Josiah Crosby,	3 00
For the second best, to F. & L. Clapp,	2 00
For the third best, to Samuel Hartwell,	1 00
For the best Porter, to John Cummings,	3 00
For the second best, to Samuel Hartwell,	2 00
For the third best, to C. S. Williams,	1 00
For the best of any other variety, to Edwin Fletcher, for Garden Royal,	3 00
For the second best, to Samuel Hartwell, for Holden Pippin,	2 00
For the third best, to Joseph H. Fenno, for Summer Pippin,	2 00
PEARS.—For the best Andrews, to C. N. Brackett,	3 00
For the second best, to John L. Bird,	2 00
For the third best, to C. E. Grant,	1 00

Doyenne Boussock, to E. W. Wood, .	$3 00
econd best, to Hovey & Co., . . .	2 00
ird best, to Charles Bird, . . .	1 00
Flemish Beauty, to Joseph H. Fenno, .	3 00
econd best, to C. E. Grant, . . .	2 00
of any other variety, to J. B. Moore, for ucrative, ...	3 00
econd best, to C. E. Grant, for Belle Lu-	2 00
ird best, to J. H. Fenno, for Golden Beurre,	1 00
s.—For the best of any variety, to J. B. for Moore's Early, ...	4 00
econd best, to J. W. Talbot, for Norwood,	3 00
ird best, to N. B. White, for Norfolk Mus-	2 00
urth best, to C. E. Grant, for Delaware, .	1 00
r the best of any variety, to J. T. Foster, ter, ...	4 00
econd best, to Samuel Hartwell, for Early rd, ...	3 00
ird best, to Miss A. C. Wheeler, for Cath-	2 00
urth best, to J. H. Fenno, for Seedling, .	1 00

:—

tuck, for Apples, ...	1 00
nings, " "	2 00
nt, for collection of Apples, . . .	1 00
kett, for Apples and Pears, . . .	2 00
unt, Jr., for Grapes, Pears, and Apples, .	1 00
rown, for Clapp's Favorite Pears, . .	1 00
Coolidge, for Pears, ...	1 00
tosh, " "	1 00
tridge, for Grapes and Pears, . . .	1 00
t, for collection of Plums, . . .	2 00
dford, for Green Gage Plums, . . .	2 00
nson, for Peaches, ...	1 00

ANNUAL EXHIBITION.

SEPTEMBER 19, 20, 21, AND 22.

Special Prizes offered by Peter Smith.

APPLES.—For the largest and handsomest dish, to Charles Stearns, for Gravenstein, ... $5 00

PEARS.—For the largest and handsomest dish, to William T. Hall, for Beurre Clairgeau, ... 5 00

FOREIGN GRAPES.—For the largest and handsomest bunch of Black, to E. W. Wood, for Black Hamburg, . 5 00

For the largest and handsomest bunch of White, to E. W. Wood, for Golden Hamburg, . . . 5 00

Society's Prizes.

APPLES.—For the best Alexander, to Joseph H. Fenno, 3 00

For the best American Beauty, to Edwin Fletcher, . 3 00

For the best Baldwin, to T. M. Davis, . . . 4 00

For the second best, to Warren Heustis, . . . 3 00

For the third best, to Samuel Hartwell, . . . 2 00

For the fourth best, to John Cummings, . . . 1 00

For the best Blue Pearmain, to Samuel Hartwell, . 3 00

For the second best, to C. N. Brackett, . . . 2 00

For the best Cogswell, to John Cummings, . . . 3 00

For the second best, to Asa Clement, . . . 2 00

For the best Danvers Winter Sweet, to John Cummings, 3 00

For the second best, to C. N. Brackett, . . . 2 00

For the third best, to Asa Clement, , . . 1 00

For the best Duchess of Oldenburg, to F. P. Fisher, . 3 00

For the second best, to O. B. Hadwen, . . . 2 00

For the best Dutch Codlin, to Mrs. C. N. S. Horner, . 3 00

For the second best, to Joseph H. Fenno, . . 2 00

For the best Esopus Spitzenburg, to O. B. Hadwen, . 4 00

For the best Holden Pippin, to Samuel Hartwell, . 3 00

For the second best, to C. N. Brackett, . . . 2 00

For the third best, to John Cummings, . . . 1 00

For the best Fall Pippin, to Asa Clement, . . . 3 00

For the best Fameuse, to Asa Clement, . . . 3 00

For the second best, to E. W. Wood, . . . 2 00

st Foundling, to Edwin Fletcher, . .	$4 00
second best, to Samuel Hartwell, . .	3 00
third best, to J. W. Manning, . . .	2 00
Fourth best, to Asa Clement, . . .	1 00
st Garden Royal, to Edwin Fletcher, . .	4 00
st Golden Russet, to Joseph H. Fenno, .	3 00
st Gravenstein, to S. G. Damon, . .	4 00
second best, to Warren Heustis, . . .	3 00
third best, to Josiah Crosby, . . .	2 00
Fourth best, to Samuel Hartwell, . . .	1 00
est Hubbardston Nonsuch, to M. W. Chad-	
, ...	4 00
second best, to John Fillebrown, . .	3 00
third best, to George N. Noyes, . . .	2 00
Fourth best, to Edwin Fletcher, . . .	1 00
st Hunt Russet, to Samuel Hartwell, . .	4 00
second best, to Asa Clement, . . .	3 00
third best, to D. W. Lothrop, . . .	2 00
Fourth best, to J. B. Moore, . . .	1 00
est King of Tompkins County, to Edwin	
er, ...	4 00
second best, to Asa Clement, . . .	3 00
third best, to C. N. Brackett, . . .	2 00
st Ladies' Sweet, to Edwin Fletcher. .	3 00
second best, to J. W. Manning, . . .	2 00
third best, to C. N. Brackett, . . .	1 00
st Lyscom, to Asa Clement, . . .	3 00
second best, to Samuel Hartwell, . .	2 00
st Maiden's Blush, to Joseph H. Fenno, .	3 00
second best, to John Cummings, . . .	2 00
third best, to J. W. Manning, . . .	1 00
st Minister, to Asa Clement, . . .	3 00
second best, to William T. Hall, . . .	2 00
st Mother, to Edwin Fletcher, . . .	4 00
second best, to John Cummings, . . .	3 00
third best, to E. W. Wood, . . .	2 00
Fourth best, to O. B. Hadwen, . . .	1 00
st Northern Spy, to John Cummings, . .	4 00
second best, to A. G. Bettison, . . .	3 00
third best, to Asa Clement, . . .	2 00

ANNUAL EXHIBITION.

SEPTEMBER 19, 20, 21, AND 22.

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APPLES.—For the largest and handsomest dish, to Charles Stearns, for Gravenstein, ... $5 00

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FOREIGN GRAPES.—For the largest and handsomest bunch of Black, to E. W. Wood, for Black Hamburg, . 5 00

For the largest and handsomest bunch of White, to E. W. Wood, for Golden Hamburg, . . . 5 00

Society's Prizes.

APPLES.—For the best Alexander, to Joseph H. Fenno, 3 00

For the best American Beauty, to Edwin Fletcher, . 3 00

For the best Baldwin, to T. M. Davis, . . . 4 00

For the second best, to Warren Heustis, . . . 3 00

For the third best, to Samuel Hartwell, . . . 2 00

For the fourth best, to John Cummings, . . . 1 00

For the best Blue Pearmain, to Samuel Hartwell, . 3 00

For the second best, to C. N. Brackett, . . . 2 00

For the best Cogswell, to John Cummings, . . . 3 00

For the second best, to Asa Clement, . . . 2 00

For the best Danvers Winter Sweet, to John Cummings, 3 00

For the second best, to C. N. Brackett, . . . 2 00

For the third best, to Asa Clement, , . . 1 00

For the best Duchess of Oldenburg, to F. P. Fisher, . 3 00

For the second best, to O. B. Hadwen, . . . 2 00

For the best Dutch Codlin, to Mrs. C. N. S. Horner, . 3 00

For the second best, to Joseph H. Fenno, . . 2 00

For the best Esopus Spitzenburg, to O. B. Hadwen, . 4 00

For the best Holden Pippin, to Samuel Hartwell, . 3 00

For the second best, to C. N. Brackett, . . . 2 00

For the third best, to John Cummings, . . . 1 00

For the best Fall Pippin, to Asa Clement, . . . 3 00

For the best Fameuse, to Asa Clement, . . . 3 00

For the second best, to E. W. Wood, . . . 2 00

st Foundling, to Edwin Fletcher. . .	$4 00
econd best, to Samuel Hartwell, . .	3 00
hird best, to J. W. Manning, . . .	2 00
ourth best, to Asa Clement, . . .	1 00
st Garden Royal, to Edwin Fletcher, . .	4 00
st Golden Russet, to Joseph H. Fenno, .	3 00
st Gravenstein, to S. G. Damon, . .	4 00
econd best, to Warren Heustis, . . .	3 00
hird best, to Josiah Crosby, . . .	2 00
ourth best, to Samuel Hartwell, . . .	1 00
st Hubbardston Nonsuch, to M. W. Chad-, ...	4 00
econd best, to John Fillebrown, . .	3 00
hird best, to George N. Noyes, . . .	2 00
ourth best, to Edwin Fletcher, . . .	1 00
st Hunt Russet, to Samuel Hartwell, . .	4 00
econd best, to Asa Clement, . . .	3 00
hird best, to D. W. Lothrop, . . .	2 00
ourth best, to J. B. Moore. . . .	1 00
st King of Tompkins County, to Edwin er, ...	4 00
econd best, to Asa Clement, . . .	3 00
hird best, to C. N. Brackett, . . .	2 00
st Ladies' Sweet, to Edwin Fletcher, .	3 00
econd best, to J. W. Manning, . . .	2 00
hird best, to C. N. Brackett, . . .	1 00
st Lyscom, to Asa Clement, . . .	3 00
econd best, to Samuel Hartwell, . .	2 00
st Maiden's Blush, to Joseph H. Fenno, .	3 00
econd best, to John Cummings, . . .	2 00
hird best, to J. W. Manning, . . .	1 00
st Minister, to Asa Clement, . . .	3 00
econd best, to William T. Hall, . . .	2 00
st Mother, to Edwin Fletcher, . . .	4 00
econd best, to John Cummings, . . .	3 00
hird best, to E. W. Wood, . . .	2 00
ourth best, to O. B. Hadwen, . . .	1 00
st Northern Spy, to John Cummings, . .	4 00
econd best, to A. G. Bettison, . . .	3 00
hird best, to Asa Clement, . . .	2 00

For the fourth best, to W. T. Hall,	$1 00
For the best Orange Sweet, to S. G. Damon,	3 00
For the second best, to John Fillebrown,	2 00
For the best Porter, to Elisha Tower,	4 00
For the second best, to John Cummings,	3 00
For the third best, to Charles Bird,	2 00
For the fourth best, to S. G. Damon,	1 00
For the best Pumpkin Sweet, to Charles Stearns,	4 00
For the second best, to Asa Clement,	3 00
For the third best, to John Cummings,	2 00
For the fourth best, to George H. Stevens,	1 00
For the best Rhode Island Greening, to E. W. Wood,	4 00
For the second best, to C. N. Brackett,	3 00
For the third best, to Charles Bird,	2 00
For the fourth best, to W. A. Craft,	1 00
For the best Roxbury Russet, to Warren Heustis,	4 00
For the second best, to John L. De Wolf,	3 00
For the third best, to John Cummings,	2 00
For the fourth best, to John L. Bird,	1 00
For the best Sudbury Sweet, to Edwin Fletcher,	3 00
For the second best, to John Cummings,	2 00
For the best Twenty Ounce, to O. B. Hadwen,	3 00
For the best Washington Strawberry, to J. H. Fenno,	3 00
For the best Yellow Bellflower, to F. B. Hayes,	3 00
For the second best, to Asa Clement,	2 00
Second prize for Crab Apples, to Benj. F. Hunt, for Transcendent,	3 00
Third prize, to Horace Partridge, for Transcendent,	2 00
Fourth Prize, to J. E. Hoar,	1 00
PEARS.—For the best Adams, to Hovey & Co.,	3 00
For the best Andrews, to Jesse Haley,	4 00
For the second best, to Horace Partridge,	3 00
For the third best, to B. G. Smith,	2 00
For the best Bartlett, to John McClure,	4 00
For the second best, to William R. Austin,	3 00
For the third best, to Hovey & Co.,	2 00
For the fourth best, to Charles Bird,	1 00
For the best Belle Lucrative, to Horace Eaton,	4 00
For the second best, to Horace Partridge,	3 00
For the third best, to C. N. Brackett,	2 00

ourth best, to J. C. Park, ...	$1 00
t Beurre d'Anjou, to W. R. Austin, . .	4 00
econd best, to J. McClure, . . .	3 00
hird best, to J. H. Fenno, . . .	2 00
ourth best, to W. P. Walker, . . .	1 00
t Beurre Bosc, to W. R. Austin, . .	4 00
econd best, to John L. Bird, . . .	3 00
hird best, to W. T. Andrews, . . .	2 00
ourth best, to Joseph H. Fenno, . .	1 00
t Beurre Clairgeau, to Joseph H. Fenno, .	4 00
econd best, to Horace Partridge, . .	3 00
hird best, to John Fillebrown, . . .	2 00
ourth best, to Charles Bird, . . .	1 00
t Beurre Diel, to A. McDermott, . .	3 00
econd best, to W. S. Janvrin, . . .	2 00
hird best, to W. C. Strong, . . .	1 00
t Beurre Gris d' Hiver Nouveau, to Hovey	3 00
econd best, to C. E. Grant, . . .	2 00
hird best, to E. W. Wood, . . .	1 00
t Beurre Hardy, to C. F. Curtis, . .	4 00
econd best, to W. R. Austin, . . .	3 00
hird best, to Mrs. H. P. Kendrick, . .	2 00
ourth best, to W. P. Walker, . . .	1 00
t Beurre Langelier, to John L. Bird, . .	3 00
econd best, to C. E. Grant, . . .	2 00
hird best, to W. R. Austin, . . .	1 00
t Beurre Superfin, to J. C. Park, . .	4 00
econd best, to Hovey & Co., . . .	3 00
hird best, to Joseph H. Fenno, . . .	2 00
ourth best, to John L. Bird, . . .	1 00
t Buffum, to Mrs. H. P. Kendrick, . .	3 00
econd best, to C. N. Brackett, . . .	2 00
hird best, to Marshall P. Wilder, . .	1 00
t Caen du France, to Hovey & Co., . .	3 00
econd best, to Marshall P. Wilder, . .	2 00
hird best, to C. E. Grant, ...	1 00
t Dana's Hovey, to Eben Snow, . .	3 00
econd best, to Hovey & Co., . . .	2 00
hird best, to E. W. Wood, . . .	1 00

For the best De Tongres, to C. E. Grant,	$3 00
For the second best, to S. G. Damon,	2 00
For the third best, to T. M. Davis,	1 00
For the best Doyenne Boussock, to Marshall P. Wilder,	3 00
For the second best, to Hovey & Co.,	2 00
For the third best, to E. W. Wood,	1 00
For the best Doyenne du Comice, to Marshall P. Wilder,	4 00
For the second best, to John C. Park,	3 00
For the third best, to Joseph H. Fenno,	2 00
For the fourth best, to Hovey & Co.,	1 00
For the best Duchesse d' Angouleme, to W. R. Austin,	4 00
For the second best, to J. McClure,	3 00
For the third best, to Mrs. H. P. Kendrick,	2 00
For the fourth best, to Joseph H. Fenno,	1 00
Second prize for Flemish Beauty, to Joseph H. Fenno,	2 00
Third prize, to J. Cruickshanks,	1 00
For the best Fulton, to Charles F. Curtis,	3 00
For the second best, to C. N. Brackett,	2 00
For the third best, to J. C. Park,	1 00
For the best Glout Morceau, to W. P. Walker,	3 00
For the second best, to John L. DeWolf,	2 00
For the third best, to Mrs. H. P. Kendrick,	1 00
For the best Goodale, to W. R. Austin,	3 00
For the second best, to Joseph H. Fenno,	2 00
For the third best, to Marshall P. Wilder,	1 00
For the best Howell, to W. S. Janvrin,	4 00
For the second best, to Jesse Haley,	3 00
For the third best, to Mrs. H. P. Kendrick,	2 00
For the fourth best, to S. G. Damon,	1 00
For the best Lawrence, to Horace Partridge,	3 00
For the second best, to John McClure,	2 00
For the third best, to John B. Moore,	1 00
For the best Louise Bonne of Jersey, to William T. Hall,	4 00
For the second best, to Alexander Dickinson,	3 00
For the third best, to Charles Bird,	2 00
For the fourth best, to T. M. Davis,	1 00
For the best Marie Louise, to Alexander Dickinson,	4 00
For the second best, to John L. DeWolf,	3 00
For the third best, to Hovey & Co.,	2 00
For the fourth best, to Marshall P. Wilder,	1 00

Merriam, to Marshall P. Wilder,	$4 00
econd best, to Hovey & Co.,	3 00
ird best, to George B. Cutter,	2 00
urth best, to John L. DeWolf,	1 00
Moore's Pound, to Hovey & Co.,	3 00
Mount Vernon, to Walker & Co.,	3 00
econd best, to A. McDermott,	2 00
ird best, to Charles Bird,	1 00
st Onondaga or Swan's Orange, to A. mott,	4 00
econd best, to W. P. Walker,	3 00
ird best, to Charles Bird,	2 00
urth best, to Horace Partridge,	1 00
Paradis d' Automne, to Marshall P. Wilder,	4 00
econd best, to Hovey & Co.,	3 00
ird best, to John L. Bird,	2 00
urth best, to C. N. Brackett,	1 00
Pratt, to Lewis Hall,	3 00
econd best, to Hovey & Co.,	2 00
ird best, to Marshall P. Wilder,	1 00
Seckel, to John L. Bird,	4 00
econd best, to Lewis Hall,	3 00
ird best, to C. E. Grant,	2 00
urth best, to Horace Partridge,	1 00
Sheldon, to J. McClure,	4 00
econd best, to George S. Harwood,	3 00
ird best, to C. F. Curtis,	2 00
urth best, to W. A. Craft,	1 00
Souvenir de Congrès, to Marshall P. Wilder,	3 00
St. Michael Archangel, to Jesse Haley,	4 00
econd best, to T. M. Davis,	3 00
ird best, to Marshall P. Wilder,	2 00
urth best, to Alexander Dickinson,	1 00
Urbaniste, to J. C. Park,	4 00
econd best, to John B. Moore,	3 00
ird best, to E. W. Wood,	2 00
urth best, to Hovey & Co.,	1 00
Vicar of Winkfield, to Horace Eaton,	3 00
econd best, to Charles Bird,	2 00
ird best, to Joseph H. Fenno,	1 00

For the best Winter Nelis, to John L. Bird, . . $3
For the second best, to W. P. Walker, . . . 2
For the third best, to W. A. Crafts, . . . 1
PEACHES.—Second prize for the best dish, to J. T. Foster, for Foster, ... 3
Third prize, to Samuel Hartwell, for Early Crawford, 2
For the best dish of Orchard House Culture, to John Falconer, for Lord Palmerston, ... 5
For the second best, to John Kelly, for Late Crawford, 4
For the third best, to John Falconer, for Late Crawford, 3
For the fourth best, to John Falconer, for Princess of Wales, ... 2
NECTARINES.—For the best dish, to John Falconer, for Rivers' Victoria, ... 4
PLUMS.—For the best collection, to Horace Eaton, . . 5
For the best dish, to Horace Eaton, for Reine Claude de Bavay, ... 3
For the second best, to J. M. Codman, . . . 2
For the third best, to H. V. Draper, for Coe's Golden Drop, ... 1
NATIVE GRAPES.—For the best six bunches Adirondac, to Horace Eaton, ... 3
For the second best, to S. G. Damon, . . . 2
For the best six bunches Concord, to Nathan Blanchard, 4
For the second best, to E. P. Richardson, . . 3
For the third best, to S. G. Damon, . . . 2
For the best Delaware, to W. H. Wilcox, . . . 3
For the second best, to S. G. Damon, . . . 2
For the third best, to F. & L. Clapp, . . . 1
For the best Hartford, to Horace Eaton, . . . 3
For the second best, to S. G. Damon, . . . 2
For the third best, to W. T. Andrews, . . . 1
For the best Israella, to S. G. Damon, . . . 3
For the second best, to J. L. Bird, ... 2
For the third best, to Horace Eaton, . . . 1
For the best of any other variety, to John B. Moore, for Moore's Early, ... 3
For the second best, to Horace Eaton, for Eumelan, 2
For the third best, to J. B. Moore, for Middlesex, . 1
FOREIGN GRAPES.—For the best six varieties, to C. M. Atkinson, ... 12

econd best, to E. H. Luke,	$10 00
hird best, to B. G. Smith,	8 00
t four varieties, to E. W. Wood,	8 00
rize for three varieties, to E. S. Rand, Jr.,	5 00
ize for two bunches of any Black Grape, S. Rand Jr.,	3 00
ize for two bunches of any White Grape, S. Rand, Jr.,	3 00

s for Apples:—

wer, for Queen of the Orchard,	1 00
no, for Orange Sweet,	1 00
arsh, for Rome Beauty,	1 00
rtwell, for twenty-three varieties of Apples,	5 00
. S. Horner, for collection,	2 00
tison, " "	1 00
wen, " "	1 00
whall, " "	2 00
arsh, for Apples,	1 00
nt, " "	1 00
no, for collection of Apples and Pears,	3 00
mings, for " " "	4 00
wers, for Apples and Pears,	1 00
ong, for Crab Apples,	1 00

s for Pears:—

ickshanks, for collection,	3 00
rtridge, " "	2 00
F. Hunt, " "	2 00
l, " "	2 00
nt, " "	2 00
rill, " "	2 00
es, " "	2 00
hell, " "	1 00
reland, " "	2 00
loore, " "	2 00
stin, for Clapp's Favorite Pears,	1 00
lapp, for Seedling Pears (Harris),	2 00

Gratuities for Foreign Grapes: —

To E. S. Rand, Jr., for collection, ... $3
B. G. Smith, " " 1

Gratuities for Native Grapes, etc.: —

To S. G. Damon, for Delaware, ... 1
W. T. Andrews, for collection, ... 1
Jonathan Mann, ... 1
Amos Bates, ... 1
E. Myrick, ... 1
N. B. White, ... 1
James H. Ricketts, for sixty-five varieties of Seedling Grapes, ... 10
John Falconer, for Peaches, orchard-house culture, . 3
W. S. Janvrin, for Quinces, ... 1
Miss A. C. Wheeler, for Basket of Fruit, . . 2

SEPTEMBER 30.

Gratuities: —

To C. N. Brackett, for Pears, ... 1
C. E. Grant, for Seckel Pears, ... 2
F. & L. Clapp, for Seedling Pears, ... 2
J. Fisk Allen, for Native Grapes, ... 1
E. P. Richardson, for collection of Grapes, . . 2
M. W. Chadbourne, for Apples, ... 1

OCTOBER 7.

PEARS.—For the best Beurre Bosc, to S. C. Perkins, . 4
For the second best, to W. R. Austin, . . . 3
For the third best, to J. V. Wellington, . . . 2
For the best Beurre Clairgeau, to W. T. Hall, . . 4
For the second best, to John Fillebrown, . . 3
For the third best, to Joseph H. Fenno, . . . 2
For the best Beurre Diel, to T. M. Davis, . . . 4
For the second best, to W. S. Janvrin, . . . 3
For the third best, to Daniel Cross, . . . 2
For the best Duchesse d'Angouleme, to John McClure, 4
For the second best, to W. R. Austin, . . . 3
For the third best, to John C. Park, . . . 2

st Louise Bonne of Jersey, to W. T. Hall, .	$4 00
second best, to T. M. Davis, . . .	3 00
third best, to Joseph H. Fenno, . . .	2 00
st Urbaniste, to Benj. B. Davis, . . .	4 00
second best, to John B. Moore, . . .	3 00
third best, to Joseph H. Fenno, . . .	2 00
or the best Alexander, to Joseph H. Fenno,	3 00
st Fall Orange, to Samuel Hartwell, . .	3 00
second best, to O. B. Hadwen, . . .	2 00
st Gravenstein, to Samuel Hartwell, . .	3 00
second best, to S. G. Damon, . . .	2 00
st Orange Sweet, to S. G. Damon, . .	3 00
second best, to Edwin Fletcher, . . .	2 00
st Porter, to S. G. Damon, . . .	3 00
second best, to John Cummings, . .	2 00
st Twenty Ounce, to O. B. Hadwen, . .	3 00
PES. — For the best six bunches Catawba, to Grant, ...	3 00
second best, to Miss A. C. Wheeler, . .	2 00
st six bunches Concord, to Nathan Blanchard,	3 00
second best, to J. W. Talbot, . . .	2 00
st six bunches Creveling, to S. G. Damon, .	3 00
second best, to Horace Eaton, . . .	2 00
st six bunches Diana, to Horace Partridge, .	3 00
second best, to William H. Wilcox, . .	2 00
st six bunches Iona, to Eben Snow, . .	3 00
second best, to S. G. Damon, . . .	2 00
st six bunches Isabella, to J. V. Wellington,	3 00
second best, to Horace Partridge, . .	2 00
prize for Wilder (No. 4) to S. G. Damon,	2 00
APES. — Por the best three varieties, two es each, to Benj. G. Smith, for Muscat Ham- Golden Hamburg, and Wilmot's New Black urg, ...	5 00
econd best, to E. W. Wood, for Wilmot's Ham- Black Hamburg, and Victoria Hamburg, .	4 00
est two bunches of any variety, to E. W. , for Wilmot's Hamburg, ...	3 00
second best, to B. G. Smith, for Golden urg, ...	2 00

Quinces.—For the best dish of any variety, to Charles Bird, for Orange Quince,	$3 00
For the second best, to W. S. Janvrin, for Apple Quince,	2 00
For the third best, to Frank M. Gilley, for Orange Quince,	1 00
Gratuities:—	
To Horace Partridge, for Pears,	2 00
Frank M. Gilley, " "	1 00
John Capen, " "	1 00
Charles Bird, " "	1 00
F. Hunt, Jr., " "	1 00
Robert Manning, " "	2 00
John McClure, " "	1 00
Joseph Parker, " "	1 00
John L. Bird, " "	2 00
J. Cruickshanks, " "	1 00
J. W. Talbot, " "	1 00
J. C. Park, " "	1 00
Hovey & Co., " "	2 00
Lewis Slack, " "	1 00
Josiah Crosby, " "	1 00
Miss H. M. Young, " "	1 00
C. N. Brackett, for collection of Pears,	2 00
G. M. Mellen, " " "	1 00
S. G. Damon, for Sheldon Pears,	1 00
Miss Sarah W. Story, for Apples,	1 00
O. B. Hadwen, " "	1 00
W. W. Winkley, " "	1 00
Elisha Tower, " "	1 00
Edwin Fletcher, for collection of Apples,	2 00
Samuel Hartwell " " "	2 00
John Cummings, for Apples and Pears,	5 00
T. M. Davis, " " " "	1 00
Augustus Torrey, " " " "	1 00
Charles Garfield, " " " "	1 00
George Frazier, " collection of Apples and Pears,	2 00
Joseph H. Fenno, " " " " " "	3 00
S. N. Gaut, " " " " " "	2 00
C. E. Grant, " " " " " "	3 00

ith, for Apples and Quinces,	$1 00
Moore, for collection of Grapes,	2 00
aton, for Grapes,	1 00
tchings, for Isabella Grapes,	1 00
ith, for collection of Foreign Grapes,	2 00

OCTOBER 14.

es :—

ffin, for Pears,	1 00
ant, for Goodale Pears,	1 00
fford, for Duchesse d' Angouleme Pears,	1 00
, for Beurre Diel Pears,	1 00
C. Wheeler, for Grapes,	1 00

OCTOBER 21.

es :—

Hopkins, for Baldwin Apples,	1 00
nadbourne, for Blue Pearmain Apples,	1 00
N. S. Horner, for Pears and Apples,	2 00
dwen, " " " "	2 00
C. Wheeler, " " " "	1 00
ellen, " " " "	1 00

OCTOBER 28.

es :—

. Fowle, for Apples,	1 00
Clapp, for Seedling Pears,	2 00
Smith, for Muscat Hamburg Grapes,	1 00

NOVEMBER 4.

es :—

ey, for Pears,	1 00
ntosh, for collection of Pears,	3 00
nadbourne, for Apples,	1 00
ackett, " "	1 00
dwen, " "	1 00
artridge, for collection of Apples,	1 00
ewhall, " " "	2 00
ent, " " "	2 00

To William T. Hall, for Apples and Pears, . . . $1
J. T. Foster, " " " " . . . 2
A. J. Dean, " " " " . . . 1
D. B. Flint, " " " " . . . 2
S. N. Gaut, " " " " . . . 2
T. M. Davis, " " " " . . . 2

NOVEMBER 11.

PEARS.—For the best Beurre d' Anjou, to W. R. Austin, 3
For the second best, to Joseph H. Fenno, . . 2
For the best Dana's Hovey, to Hovey & Co., . . 3
For the second best, to T. M. Davis, . . . 2
For the best Easter Beurre, to Alexander Dickinson, . 3
For the second best, to Joseph H. Fenno, . . 2
For the best Glout Morceau, to A. S. M'Intosh, . . 3
For the second best, to W. P. Walker, . . . 2
For the best Lawrence, to Joseph H. Fenno, . . 3
For the second best, to John McClure, . . . 2
For the best Winter Nelis, to John L. Bird, . . 3
For the second best, to W. P. Walker, . . . 2

French Premiums.

WINTER APPLES.—For the best Baldwin, to John Cummings, ... 3
For the second best, to J. T. Foster, . . . 2
For the best Hubbardston Nonsuch, to John B. Moore, 3
For the second best, to Joseph H. Fenno, . . 2
For the best King of Tompkins County, to Asa Clement, 3
For the second best, to Edwin Fletcher, . . . 2
For the best Northern Spy, to S. N. Gaut, . . . 3
For the second best, to W. T. Hall, . . . 2
For the best Rhode Island Greening, to Frank M. Gilley, 3
For the second best, to E. W. Wood, . . . 2
For the best Roxbury Russet, to John Cummings, . 3
For the second best, to Joseph H. Fenno, . . 2

Gratuities:—

To John L. Bird, for Beurre d'Aremberg Pears, . . 1
J. C. Park, for Doyenne du Comice Pears, . . 1
J. Cruickshanks, for Beurre d'Anjou Pears, . . 1
W. P. Walker, for Vicar of Winkfield Pears, . . 1

r Dickinson, for Pears, ... $1 00
vis, " " 1 00
ıt, " " 1 00
Clure, " " 1 00
ınt, for collection of Pears, ... 2 00
ith, " " " 1 00
etcher, for collection of Apples, . . . 2 00
ent, " " " . . . 2 00
ylor, " " " . . . 2 00
artwell, " " " . . . 1 00
ımings, for collection of Apples and Pears, . 3 00
. Fenno, " " " . 2 00
C. Wheeler, for collection, ... 1 00
gent, for Oranges, ... 1 00

ty's Silver Medal was awarded to J. H. Fenno, for
rry, Norfolk.

ective Prize of fifty dollars was awarded to Marshall
r the best Seedling Strawberry, after a public trial of
he President Wilder, for its size, beauty, and quality.

t awarded to each contributor is as follows:

Fisk . .	$6	Coffin, William E. . .	$1
T. . .	4	Comley, James . .	9
M. . .	17	Cooledge, W. D. . .	1
. . .	32	Craft, George . . .	1
. . .	23	Crafts, William A. . .	3
G. . .	4	Crosby, Josiah . .	9
. . .	34	Cross, Daniel . . .	2
. . .	31	Cruickshanks, George .	1
athan . .	7	Cruickshanks, James .	6
. . .	4	Cummings, John . .	65
N. . .	44	Curtis, Charles F. . .	15
D. . .	5	Cutter, George B. . .	2
. . .	1	Damon, S. G. . . .	39
M. W. .	11	Davis, B. B. . . .	20
R. . .	3	Davis, T. M. . . .	26
n C. . .	5	Dean, A. J. . . .	1
. . .	20	DeWolf, John L. . .	9
. . .	50	Dickinson, Alexander .	12
M. . .	2	Draper, H. V. . .	1

Eaton, Horace,	$53	Ireland, George W.	$2
Eaton, Joseph B.	1	Irvin, John	1
Falconer, John	26	Janvrin, W. S.	18
Faxon, E.	1	Joyce, Mrs. S.	1
Felton, A. W.	3	Kelley, John	4
Fenno, J. H.	151	Kendrick, Mrs. H. P.	10
Fillebrown, John	17	Kingman, C. D.	18
Fisher, J. R.	1	Langworthy, I. P.	4
Fisher, F. P.	3	Lothrop, D. W.	2
Fletcher, Edwin	52	Luke, E. H.	10
Flint, D. B.	5	Mann, Jonathan	1
Fobes, Mrs. B.	4	Manning, J. W.	5
Foster, J. T.	15	Manning, Robert	6
Fowle, Charles L.	1	Marsh, Francis	2
Fraizer, George	2	McClure, John	38
Frost, Stiles	2	McDermott, A.	9
Garfield, Charles	33	Mellen, G. M.	5
Gaut, S. N.	8	Merrill, S. A.	2
Gerry, C. F.	1	M'Intosh, A. S.	11
Getchell, S. S.	1	Mitchell, E. M.	1
Gill, Mrs. E. M.	14	Moore, John B.	124
Gilley, Frank M.	17	Myrick, E.	1
Gould, Frederick	2	Newhall, Josiah	4
Grant, C. E.	53	Newhall, Wilbur T.	2
Hadwen, O. B.	25	Noyes, George N.	11
Haley, Jesse	12	Nugent, James	14
Hall, Lewis	8	Oldreive, R.	1
Hall, William T.	23	Park, John C.	23
Hartwell, Samuel	59	Parker, Joseph	1
Harwood, G. S.	3	Partridge, Horace	27
Hayes, F. B.	5	Perkins, S. C.	4
Heustis, Warren	36	Pierce, George W.	11
Hill, George	2	Pillsbury, Enoch	1
Hitchings, E. H.	1	Rand, E. S., Jr.	14
Hoar, J. E.	1	Richards, J. S.	3
Hodgkins, John E.	1	Richardson, C. E.	2
Horner, Mrs. C. N. S.	8	Richardson, E. P.	17
Hovey & Co.	70	Ricketts, J. H.	10
Hunt, B. F.	6	Russell, Walter	1
Hunt, F., Jr.	1	Safford, A. H.	1

R. . .	$1	Walker & Co. . . .	$3
W. . .	4	Ware, Benj. P. . .	2
. . .	2	Waters, G. F. . .	3
. . .	78	Wellington, J. V. . .	5
. . .	2	Weston, Daniel, . .	1
. . .	9	Wheeler, Miss A. C. .	10
les . .	9	White, N. B. . . .	10
ge M. .	3	Wilcox, J. A. J. . .	4
W. . .	1	Wilcox, William H. .	5
V. . .	1	Wilder, Marshall P. .	80
. . .	1	Williams, C. S. . .	1
. D. . .	2	Wilson, H. W. . .	1
. . .	6	Winkley, W. W. . .	1
s . .	2	Wiswall, H. M. . .	5
stus . .	1	Wood, E. W. . . .	45
. . .	6	Wood, W. K. . . .	3
. . .	14	Woodford, J. H. . .	2
. . .	4	Young, H. M. . .	1
. . .	15		

ppropriation, ...		$2,100
eter Smith fund, ...		20
		$2,120
d, ...	$1,423	
rize to Marshall P. Wilder, .	50	
. . . . .	20	
arded, ...	527	2,020
not awarded, ...		$100

REPORT

OF THE

Committee on Vegetables,

FOR THE YEAR 1876.

BY C. N. BRACKETT, CHAIRMAN.

The Committee on Vegetables present to the Society the follow ing brief report of their doings for the year 1876.

The general impression that we derive from the exhibitions the year is, that, taken as a whole, those of the past season hav been, beyond dispute, the best ever made in this departmer since the organization of the Society. The number, quality, ar variety of specimens on exhibition have furnished pleasing proo of the high state of cultivation in this vicinity, and have show that our leading cultivators are striving, in honorable competitio to bring to perfection the various products of the field and garde The weekly exhibitions have been much in advance of those last year, and if we take into consideration the near approach many of the specimens offered, to the desired standard of excellenc together with the constantly increasing competition in this depar ment of the Society's exhibitions, we are led to remark, that spirit of enterprise is abroad, which is not only encouraging, b gives the fairest promise for the future. Every cultivator wh desires to be successful, or who expects to realize a profit from h crops, should keep a two-fold purpose in view, in respect to th quality of the various productions he raises: first, never to allo any good thing to deteriorate on his hands; and second, to be co stantly taxing the forces of nature to produce a better than th best product yet known. It is an established fact in vegetable lif that deterioration is quite as possible as improvement. It is n

ve "the earth yield her increase" in abundance; that ld be made better in quality, and more desirable year

the improvement noticed in some of the leading vegetables during the past few years, is due to the preciation by cultivators of the importance of pure and s. This is a matter which we are convinced is receiving on than formerly. Some of the best specimens seen on nd which have taken first prizes the past season, have n the collections of those contributors who grow their nd in some instances make a specialty of some par- t, as the cauliflower, cabbage, melon, squash, celery, or some one of the various root crops. Year after stant care in their selection, and by saving from only the most perfect specimens, their stock of seeds has been such an extent as to be sought after from far and near, nand almost fabulous prices, if they should chance to us to dispose of. Hence, it requires very little common rceive that a cultivator who is satisfied to gather his ly and promiscuously, cannot successfully compete with eful and prudent neighbor, either in the prices which or his products in the market, or in taking first prizes s.

sional exhibition of Lettuce, Cucumbers, Mushrooms, andelions, and other forced vegetables, previous to the bition, were made in the Library Room of the Society, l to make the weekly shows interesting during the d early spring months. For these contributions we are ted to Josiah Crosby, Hovey & Co., James Comley, ell, and George Hill.

alea Exhibition, April 8th, the display of forced vege- ot so large as on some former occasions, but what was uantity was more than made up in the superior quality mens offered. At this exhibition, C. M. Atkinson mens of a new and very beautiful variety of Parsley, very ornamental, and which your Committee consider a isition. June 3d, we were favored with some very fine Asparagus, from John B. Moore and Samuel Hartwell, as usual, taking the first prize. Large and superior ere also shown at this time by Josiah Crosby, Walter

Russell, M. W. Chadbourne, and others. On June 27th and July 8th, the exhibitions were unusully fine, and the different varieties shown bore ample evidence of care and skill in their cultivation. July 15th, some exceedingly fine and well grown specimens of the Black Pekin Egg Plant were exhibited by James Bard, gardener to Harvey D. Parker, who also showed fine specimens of Boston Market and Canada Victor Tomatoes.

The Emery Tomato, of which favorable mention was made in our report for 1875, was again on exhibition during the past season. It is a valuable acquisition, and bids fair, in the opinion of your Committee, to rival many long established favorites. The specimens of Pekin and Large Purple Egg Plant, shown at the exhibition on the 12th of August, were the largest and most perfectly grown your Committee have ever seen. The contributors were George Hill, Josiah Crosby, Walter Russell, and George W. Pierce. August 26th, and again at the Annual Exhibition, C. M. Atkinson exhibited a tomato under the name of the "Kelly." It is a large, smooth, solid, and remarkably handsome variety. Mr. Atkinson speaks very highly of its merits, and considers it superior to some of the older sorts, and worthy of trial.

Established varieties of potatoes have taken the lead this season for nearly all the prizes at the Annual Show. No large collections were on exhibition, and no new varieties, except a seedling from L. W. Weston, which he enters for the Society's Prospective Prize. No description of this seedling has been furnished your Committee.

It has not escaped the attention of cultivators, that insects destructive to vegetation are alarmingly on the increase. If we may be allowed to judge from the experience of the past season, "eternal vigilance" is to be the price of potatoes next year. A neighbor showed us his field the past summer, which was literally alive with that new pest, the Colorado beetle, and, very naturally, inquired how to exterminate them. This is a question perhaps not very easily answered, but it is one which every cultivator must look squarely in the face, and it presents a wide and open field for experiment.

The display of vegetables at the Annual Exhibition was pronounced the best ever made. There was no part of the vegetable garden left unrepresented at this season. Among the largest contributors were Walter Russell, John Cummings, S. A. Merrill, and Mrs. M. T. Goddard, whose collections were much admired.

izes offered for Celery, from the fund donated by
were awarded to George Hill for the best six roots,
sby for the second best.

n, your committee would signify their entire satisfac-
esults of the past year's exhibitions. The improve-
l in this department is full of promise, and should
o greater perseverance in the future. The attention
is called to important changes in the Schedule of
coming year. Also to Rule 4, page 29.

d list shows the amount of prizes and gratuities
ur Committee the past year.

is respectfully submitted.

C. N. Brackett,
Walter Russell,
George Hill,
George W. Pierce,
John Fillebrown,
Josiah Crosby,
Anthony Hatch,

Vegetable Committee.

PRIZES AND GRATUITIES FOR VEGETABLES.

DECEMBER 18, 1875.

Gratuity: —

To Walter Russell, for Cauliflowers, ... $2

JANUARY 1, 1876.

Gratuity: — .

To C. H. Brackett, for Mushrooms, ... 1

JANUARY 8.

Gratuities:—

To Twombly & Son, for Dandelions, ... 1
C. H. Brackett, for Mushrooms, ... 1

JANUARY 15.

Gratuity: —

To James Comley, for Rhubarb, ... 2

JANUARY 22.

Gratuities:—

To Josiah Crosby, for Celery, ... 2
James Comley, " Rhubarb, ... 2
C. H. Brackett, " Mushrooms, ... 1

JANUARY 29.

Gratuities: —

To C. H. Brackett, for Mushrooms, ... 1
Hovey & Co., " " 1

FEBRUARY 5.

Gratuity: —

To James Comley, for Rhubarb, ... 3

FEBRUARY 12.

Gratuities:—

C. H. Brackett, for Mushrooms and Rhubarb,	$3 00
James Comley, for Rhubarb,	2 00
George W. Pierce, for Tennisball Lettuce,	2 00

FEBRUARY 19.

Gratuity:—

Walter Russell, for Tennisball Lettuce,	2 00

MARCH 4.

Gratuity:—

James Comley, for Rhubarb,	2 00

MARCH 11.

Gratuities:—

W. Russell, for collection,	4 00
J. Crosby, " "	4 00
George W. Pierce, for Lettuce,	2 00
George Hill, " "	2 00
James Comley, for Mushrooms,	2 00

MARCH 18.

Gratuities:—

W. Russell, for collection,	3 00
George Hill, " Tennisball Lettuce,	2 00
J. Comley, " Mushrooms,	2 00

MARCH 25.

Gratuities:—

W. Russell, for collection,	4 00
George F. Stone, for Tennisball Lettuce,	2 00
George Hill, " " "	2 00

MARCH 25.

Gratuities:—

James Comley, for Mushrooms,	3 00
Josiah Crosby, for Lettuce,	2 00

AZALEA EXHIBITION.

April 8.

Parsley. — For the best dish, of two quarts, to C. M. Atkinson,	$4 00
Lettuce. — For the best four heads of Tennisball, to Josiah Crosby,	4 00
For the second best, to George F. Stone,	3 00
For the third best, to W. T. Andrews,	2 00
Radishes. — For the best four bunches of Long Scarlet, to Walter Russell,	4 00
For the second best, to J. Crosby,	3 00
For the third best, to C. W. Chamberlain,	2 00
For the best Turnip Rooted, to W. Russell,	4 00
Rhubarb. — For the best twelve stalks, to James Comley,	4 00
Cucumbers. — For the best pair, to J. W. Twombly & Son,	4 00
Mushrooms. — For the best dish, to Hovey & Co.,	4 00
Gratuities: —	
To W. Russell, for collection,	2 00
C. W. Chamberlain, for Lettuce,	2 00

April 22.

Gratuity: —

To G. F. Stone, for Lettuce,	2 00

May 6.

Gratuity: —

To W. Russell, for collection,	4 00

May 13.

Gratuities: —

To W. Russell, for collection,	4 00
J. Crosby, " Radishes,	1 00
J. B. Moore, " Asparagus,	2 00
B. G. Smith " "	1 00
C. M. Atkinson, for Turnip Greens,	1 00
M. W. Chadbourne, for Rhubarb,	2 00

MAY 20.

Gratuities: —

o W. Russell, for collection,	$3 00
M. W. Chadbourne, for Asparagus,	2 00
B. G. Smith, " "	1 00
J. B. Moore, " "	2 00
Charles Garfield, for Lettuce,	2 00
Alexander Anderson, for Rhubarb,	2 00

MAY 27.

Gratuities: —

o J. B. Moore, for Asparagus,	2 00
Alexander Anderson, for Rhubarb,	2 00
Mrs. E. M. Gill, " "	1 00

JUNE 3.

SPARAGUS. — For the best four bunches, to J. B. Moore,	4 00
For the second best, to Samuel Hartwell,	3 00
For the third best, to M. W. Chadbourne,	2 00
UCUMBERS. — For the best pair, to J. Crosby,	4 00
For the second best, to W. Russell,	3 00
HUBARB. — For the best twelve stalks, to Alexander Dickinson,	4 00
For the second best, to C. F. Curtis,	3 00
For the third best, to S. Hartwell,	2 00
ADISHES. — For the best Long Scarlet, to J. Crosby,	4 00
For the second best, to W. Russell,	3 00
For the best Turnip Rooted, to W. Russell,	4 00
TTUCE. — For the best four heads, to Josiah Crosby, for All the Year Round,	4 00
For the second best, to Josiah Crosby, for Tennisball,	3 00
For the third best, to Charles Garfield,	2 00
RROTS. — For the best twelve Short Scarlet, to J. Crosby,	4 00

Gratuities: —

Josiah Crosby, for Egyptian Beets,	2 00
Walter Russell, for collection,	2 00
E. W. Whitney, for Asparagus,	1 00
A. D. Capen, for Rhubarb,	1 00

JUNE 10.

Gratuity:—

To A. S. M'Intosh, for Artichokes, ... $1

JUNE 17.

Gratuity:—

To M. W. Chadbourne, for Hill's Early Peas, . . 3

JUNE 21.

Gratuities:—

To M. W. Chadbourne, for collection, ... 4
Walter Russell, " " 6
C. N. Brackett, for Lettuce, ... 2
C. E. Grant, for collection of Peas, . . . 3
Charles Garfield, for Peas, ... 1
W. C. Child, for Early Dexter Peas, . . . 2

JUNE 24.

Gratuities:—

To M. W. Chadbourne, for collection of Peas, . . 1
G. M. Mellen, " " " . . 2

STRAWBERRY SHOW.

JUNE 27.

PEAS.—For the best peck, to W. C. Child, for Advancer, $4
For the second best, to Walter Russell, for Alpha, 3
For the third best, to G. M. Mellen, . . . 2
BEETS.—For the best Turnip Rooted, to J. Crosby, . 4
For the second best, to W. Russell, . . . 3
For the third best, to George W. Pierce, . . . 2
For the best Egyptian, to J. Crosby, ... 4
For the second best, to G. W. Pierce, . . . 3
CUCUMBERS.—For the best pair, to Walter Russell, . 4
For the second best, to J. Crosby, ... 3
For the third best, to George W. Pierce, . . . 2
LETTUCE.—For the best, of any variety, to G. W. Pierce, 4
For the second best, to W. Russell, . . . 3
For the third best, to C. N. Brackett, . . . 2

ARROTS.—For the best twelve Short Scarlet, to J. Crosby,	$4 00
NIONS.—For the best twelve, to J. Crosby, . . .	4 00
TATOES.—For the best peck, to C. D. Kingman, for Alpha, ...	4 00

Gratuities:—

Josiah Crosby, for Tailby's Hybrid Cucumbers, . .	2 00
George W. Pierce, for collection, ...	3 00
Walter Russell, " "	2 00
Josiah Crosby, " "	4 00

JULY 1.

Gratuity:—

W. C. Child, for Advancer Peas, ...	2 00

JULY 8.

ANS.—For the best peck of Cranberry, to Josiah Crosby,	4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to Walter Russell, for Horticultural,	2 00
UASHES.—For the best four Summer, to Walter Russell,	3 00
AS.—For the best peck, to G. M. Mellen, for Advancer,	4 00
IONS.—For the best twelve specimens, to Josiah Crosby,	4 00
BBAGES.—For the best four, to Walter Russell, for Wyman, ...	4 00
For the second best, to J. Crosby, for Wyman, .	3 00
For the third best, to J. Crosby, for Wakefield, .	2 00
MATOES.—For the best twelve, to J. Crosby, for Canada Victor, ...	4 00
For the second best, to George W. Pierce, for Emery,	3 00

Gratuities:—

C. D. Kingman, for Wax Beans, ...	1 00
W. C. Child, " " "	1 00
W. Russell, " " "	1 00
W. K. Wood, " " "	1 00
C. N. Brackett, for Dwarf Egg Plant, . . .	1 00
Joseph Tailby, for collection of New Peas, . .	3 00
George W. Pierce, for collection, ...	1 00

JULY 15.

TOMATOES.—For the best twelve, to W. Russell, for Boston Market, ... $4
For the second best, to James Bard, for Boston Market, ... 3
For the third best, to George W. Pierce, for Gen. Grant, ... 2
CORN.—For the best twelve ears of Sweet, to W. C. Child, 4

Gratuities:—

To James Bard, for Black Pekin Egg Plant, . . . 2
E. W. Wood, for Tom Thumb Corn, . . . 1
Josiah Crosby, for Early Rose Potatoes, . . . 2
C. N. Brackett, for collection, ... 3
W. C. Child, " " 1

JULY 22.

SQUASHES.—For the best four Marrow, to Josiah Crosby, 4
CABBAGES.—For the best Drumhead to W. Russell, . 4
TOMATOES.—For the best twelve, to George Hill, for Emery, ... 4
For the second best, to C. N. Brackett, for Gen. Grant, ... 3
For the third best, to C. N. Brackett, for Emery, . 2

Gratuities:—

To George Hill, for Egg Plant and Corn, . . . 3
C. E. Grant, for Corn, ... 1
W. K. Wood, for Wax Beans, ... 1
L. W. Weston, for collection, ... 3
W. Russell, " " 4
W. C. Child, " " 3

JULY 29.

TOMATOES.—For the best twelve, to C. N. Brackett, for Gen. Grant, ... 4
For the second best, to George Hill, for Emery, . 3
For the third best, to C. N. Brackett, for Emery, . 2
For the fourth best, to George Hill, for Boston Market, ... 1

'ORN.—For the best twelve ears of Sweet, to W. Russell, $4 00
For the second best, to S. Hartwell, . . . 3 00
For the third best, to C. N. Brackett, . . . 2 00

JULY 29.

'GG PLANT.—For the best four specimens of Black Pekin, to Josiah Crosby, ... 4 00
For the second best, to James Bard, . . . 3 00
For the third best, to G. W. Pierce, . . . 2 00

Gratuities:—

'o Josiah Crosby, for Onions, ... 1 00
W. C. Child, for Sieva Beans, ... 1 00
G. M. Mellen, for collection, ... 1 00
C. E. Grant, " " 2 00
Walter Russell, for Purple Egg Plant, . . . 3 00
" " " collection of Tomatoes, three varieties, ... 2 00
George W. Pierce, for Emery Tomatoes, . . . 1 00

AUGUST 5.

WEET CORN.—For the best Early Crosby, to Samuel Hartwell, ... 4 00
For the second best, to M. W. Chadbourne, . . 3 00
For the third best, to C. E. Grant, . . . 2 00
For the best of any other variety, to Samuel Hartwell, for Burr's, ... 4 00
For the second best, to John B. Moore, for Early Concord, ... 3 00
For the third best, to C. N. Brackett, for Triumph, . 2 00
QUASHES.—For the best four Marrow, to Walter Russell, 4 00
For the second best, to Josiah Crosby, . . . 3 00
OMATOES.—For the best twelve specimens of Gen. Grant, to C. N. Brackett, ... 4 00
For the second best, to Walter Russell, . . . 3 00
For the third best, to James Bard, ... 2 00
For the best twelve specimens of Boston Market, to George Hill, ... 4 00
For the second best, to Walter Russell, . . . 3 00
For the third best, to George W. Pierce, . . 2 00

For the best of any other variety, to C. N. Brackett, for Emery, ... $4
For the second best, to G. W. Pierce, for Emery, . 3
For the third best, to George Hill, for Emery, . 2

Gratuities:—

To C. M. Atkinson, for collection, ... 4
Walter Russell, for Egg Plant and Cabbages, . . 3
N. B. White, for Early Rose Potatoes, . . . 1
C. N. Brackett, for Crosby Corn and Egg Plant, . 2
D. B. Flint, for Lima Beans, ... 2
C. E. Grant, " " " 2

AUGUST 12.

EGG PLANT.—For the best four specimens of Black Pekin, to Josiah Crosby, ... 4
For the second best, to G. W. Pierce, . . . 3
For the best Large Round Purple, to George Hill, . 4
For the second best, to Walter Russell, . . . 3
For the third best, to Josiah Crosby, . . . 2
GREENFLESH MELONS.—For the best four specimens, to George Hill, ... 4
For the second best, to Walter Russell, . . . 3
For the third best, to Josiah Crosby, ... 2
MUSKMELONS. — For the best four specimens, to George Hill, ... 4
For the second best, to Josiah Crosby, . . . 3
TOMATOES. — For the best twelve of any variety, to C. N. Brackett, for Emery, ... 4
For the second best, to C. N. Brackett, for Gen. Grant, ... 3
For the third best, to George W. Pierce, for Emery, 2
BEANS. — For the best two quarts of Large Lima, to C. E. Grant, ... 4
For the second best, to D. B. Flint, . . . 3
For the third best, to B. G. Smith, . . . 2

Gratuities: —

To G. W. Pierce, for Texan Egg Plant, . . . 1
Hovey & Co., for New Zealand Spinach, . . . 1

o Samuel Hartwell, for Burr's Corn, . . . $1 00
W. Russell, for Stowell's Evergreen Corn, . . 1 00
C. N. Brackett, for Triumph Corn, ... 1 00

AUGUST 19.

REENFLESH MELONS. — For the best four of any variety, to Walter Russell, ... 4 00
For the second best, to George Hill, . 3 00
USKMELONS. — For the best four, to George Hill, . . 4 00
GG PLANT. — For the best four specimens of Large Round Purple, to W. Russell, ... 4 00
For the second best, to George W. Pierce, . . 3 00
For the third best, to George Hill, ... 2 00
For the best Black Pekin, to George W. Pierce, . . 4 00

Gratuities: —

o John Cummings, for collection, ... 3 00
C. N. Brackett, " " 3 00
C. E. Grant, " " . , . . . 2 00
W. Russell, " " 2 00
Samuel Hartwell, " " 1 00
H. C. Bowers, " " 1 00
Joseph Tailby, " Moore's Vegetable Cream Squash, 1 00
D. B. Flint, " Sieva Beans, ... 1 00
George Craft, " Burr's Corn, ... 1 00

AUGUST 26.

OTATOES. — For the best peck of any variety, to Mrs. M. T. Goddard, for Early Rose, . . . 4 00
For the second best, to L. M. Weston, for Snow Flake, ... 3 00
For the third best, to J. Cummings, for Snow Flake, 2 00
ANS. — For the best two quarts of Large Lima, to B. G. Smith, ... 4 00
For the second best, to C. E. Grant, . . . 3 00
For the third best, to Mrs. E. M. Gill, . . . 2 00
PPERS. — For the best twelve specimens, to Josiah Crosby, ... 4 00
For the second best, to C. N. Brackett, . . . 3 00
For the third best, to Walter Russell, . . . 2 00

Gratuities: —

To John Fillebrown, for Greenflesh Melons, . . . $1
Miss Sabra Carter, for Melons, ... 1
C. M. Atkinson, for Kelly Tomatoes, . . . 1
J. B. Moore, for Cauliflowers, ... 2
Mrs. M. T. Goddard, for collection, . . . 2
Walter Russell, " " 2
John Cummings, " " 4
George Craft, " " 1
C. N. Brackett, " " 2

SEPTEMBER 2.

BEANS.—For the best two quarts of Large Lima, to C. E. Grant, ... 4
For the second best, to B. G. Smith, . . . 3
For the third best, to Mrs. E. M. Gill, . . . 2
WATERMELONS.—For the best pair, to Samuel Hartwell, for Black Spanish, ... 4
For the second best, to J. S. Richards, for Mountain Sprout, ... 3
For the third best, to Samuel Hartwell, for Mountain Sweet, ... 2
GREENFLESH MELONS.—For the best four specimens, to George Russell, ... 4
For the second best, to George W. Pierce, . . 3
For the third best, to Walter Russell, . . . 2
CELERY.—For the best four roots, to Josiah Crosby, . 4
PEPPERS.—For the best twelve, to Josiah Crosby, . . 4
For the second best, to C. N. Brackett, . . . 3
For the third best, to Walter Russell, . . . 2

Gratuities:—

To John Cummings, for collection, ... 4
George W. Pierce, " " 2

SEPTEMBER 9.

CELERY.—For the best four roots, to Josiah Crosby, . 4
SALSIFY.—For the best twelve specimens, to George W. Pierce, ... 4

For the second best, to Josiah Crosby, . . .	$3 00
For the third best, to Walter Russell, . . .	2 00
AULIFLOWERS.—For the best four, to John B. Moore, .	4 00
For the second best, to John Cummings, . .	3 00
Gratuity:—	
o John Cummings, for collection, ...	2 00

ANNUAL EXHIBITION.

SEPTEMBER 19, 20, 21, AND 22.

Special Prize offered by Peter Smith.

ELERY.—For the best six roots, to George Hill, . .	$8 00
For the second best, to Josiah Crosby, . . .	5 00

Society's Prizes.

EETS.—For the best Turnip Rooted, twelve specimens, to George F. Stone, ...	4 00
For the second best, to Mrs. M. T. Goddard, . .	3 00
For the third best, to John Fillebrown, . . .	2 00
For the best Long Blood, to Josiah Crosby, . .	4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to Mrs. M. T. Goddard, . .	2 00
ARROTS.—For the best Short Scarlet, twelve specimens, to W. Russell, ...	4 00
For the second best, to George W. Pierce, . .	3 00
For the third best, to Mrs. M. T. Goddard, . .	2 00
or the best Long Orange, to Walter Russell, . .	4 00
For the second best, to J. Crosby, ...	3 00
For the third best, to Mrs. M. T. Goddard, . .	2 00
For the best Intermediate, to John Fillebrown, . .	4 00
For the second best, to Josiah Crosby, . . .	3 00
For the third best, to John Cummings, . . .	2 00
ORN.—For the best Sweet, twelve ears, to J. Cummings,	4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to S. A. Merrill, . . .	2 00
For the best Field Corn, twenty-five ears, to Mrs. M. T. Goddard, ...	4 00
For the second best, to J. B. Moore, . . .	3 00
For the third best, to A. T. Brown, . . .	2 00

CAULIFLOWERS.—For the best four, to Mrs. M. T. Goddard,	$4 00
For the second best, to J. B. Moore,	3 00
For the third best, to J. Cummings,,	2 00
BRUSSELLS SPROUTS.—For the best two quarts, to Mrs. M. T. Goddard,	4 00
CELERY.—For the best four roots, to George Hill,	4 00
For the second best, to J. Crosby,	3 00
For the third best, to J. Fillebrown,	2 00
TOMATOES.—For the best three varieties, to J. Cummings,	5 00
For the second best, to C. N. Brackett,	4 00
For the third best, to J. J. H. Gregory,	3 00
For the best Arlington, twelve specimens, to J. Cummings,	3 00
For the best Boston Market, to J. J. H. Gregory,	3 00
For the best Canada Victor, to J. Cummings,	3 00
For the best Gen. Grant, to C. N. Brackett,	3 00
For the best of any other variety, to C. M. Atkinson, for Kelly,	3 00
For the best twenty-four specimens, to J. J. H. Gregory, for Paragon,	4 00
For the second best, to J. Cummings, for Canada Victor,	3 00
For the third best, to J. J. H. Gregory, for Trophy,	2 00
OKRA.—For the best twenty-four specimens, to Mrs. M. T. Goddard,	4 00
For the second best, to A. T. Brown,	3 00
For the third best, to Walter Russell,	2 00
MARTYNIAS.—For the best twenty-four specimens, to George W. Pierce,	4 00
For the second best, to Mrs M. T. Goddard,	3 00
For the third best, to Walter Russell,	2 00
CRANBERRIES.—For the best half peck, to S. N. Gifford,	4 00
For the second best, to O. M. Holmes,	3 00
For the third best, to C. N. Brackett,	2 00
GREENFLESH MELONS.—For the best four specimens, to George W. Pierce,	4 00
For the second best, to Edward Lawrence,	3 00
MUSKMELONS.—For the best four specimens, to S. A. Merrill,	4 00
WATERMELONS.—For the best pair, to Edward Sumner,	4 00

For the second best, to Samuel Pratt, . . .	$3 00
For the third best, to Samuel Hartwell, . . .	2 00
MA BEANS.—For the best two quarts, to C. M. Atkinson,	4 00
For the second best, to B. G. Smith, . . .	3 00
For the third best, to Josiah Crosby, . . .	2 00
ARSNIPS.—For the best twelve, to Walter Russell, .	4 00
For the second best, to W. W. Rawson, . . .	3 00
For the third best, to Josiah Crosby, . . .	2 00
TATOES.—For the best four varieties, to Walter Russell,	6 00
For the second best, to Mrs. M. T. Goddard, . .	5 00
For the third best, to J. Cummings, . . .	4 00
For the best peck of Bresee's Prolific, to J. Cummings,	3 00
For the best Brownell's Beauty, to J. Cummings, .	3 00
For the best Early Rose, to Mrs. M. T. Goddard, .	3 00
For the best Jackson White, to C. N. Brackett, . .	3 00
For the best Snow Flake, to Walter Russell, . .	3 00
For the best of any other variety, to J. Cummings, for Eureka, ...	3 00
LSIFY.—For the best twelve specimens, to W. A. Crafts,	4 00
For the second best, to W. Russell, . . .	3 00
For the third best, to George W. Pierce, . .	2 00
UASHES.—For the best Canada, four specimens, to Josiah Pratt, ...	4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to Mrs. M. T. Goddard, . .	2 00
For the best Hubbard, to J. J. H. Gregory, . .	4 00
For the second best, to George Hill, . . .	3 00
For the third best, to Seth W. Hathaway, . .	2 00
For the best Marblehead, to J. J. H. Gregory, . .	4 00
For the second best, to Seth W. Hathaway, . .	3 00
For the third best, to J. Cummings, . . .	2 00
For the best Marrow, to George Hill, ...	4 00
For the second best, to J. Cummings, . . .	3 00
For the third best, to John Fillebrown, . . .	2 00
For the best Turban, to J. Cummings, ...	4 00
For the second best, to John B. Moore, ...	3 00
For the third best, to Seth W. Hathaway, . .	2 00
For the largest and best Mammoth, not less than 100 lbs., the Society's Bronze Medal, to Anthony Hatch.	
RNIPS.—For the best twelve specimens, to J. Fillebrown,	3 00

For the second best, to W. Russell, . . . $2
For the third best, to Anthony Hatch, . . . 1
For the best Swedish Turnips, twelve specimens, to Mrs. M. T. Goddard, ... 3
For the second best, to A. T. Brown, . . . 2
For the third best, to J. Cummings, . . . 1
CABBAGES.—For the best Drumhead, three specimens, to Seth W. Hathaway, ... 4
For the second best, to J. Cummings, . . . 3
For the third best, to Mrs. M. T. Goddard, . . 2
For the best single specimen, to J. Cummings, . . 3
For the best Red, to George F. Stone, . . . 4
For the second best, to Anthony Hatch, . . . 3
For the third best, to J. Cummings, . . . 2
For the best Savoy, to J. Cummings, ... 4
For the second best, to S. A. Merrill, . . . 3
For the third best, to Mrs. M. T. Goddard, . . 2
HORSERADISH.—For the best six roots, to W. W. Rawson, 4
For the second best, to John Fillebrown, . . 3
For the third best, to Walter Russell, . . . 2
PEPPERS.—For the best peck, to C. N. Brackett, . . 4
For the second best, to Charles Stearns, . . . 3
For the third best, to George F. Stone, . . . 2
ONIONS.—For the best peck, of any variety, to Edward Sumner, ... 4
For the second best, to J. B. Moore, . . . 3
For the third best, to George W. Pierce, . . 2
For the best three varieties, one peck each, to J. J. H. Gregory, ... 5
For the second best, to J. Cummings, . . . 4
For the third best, to Josiah Crosby, . . . 3
EGG PLANTS.—For the best Black Pekin, four specimens, to Josiah Crosby, ... 4
For the second best, to George W. Pierce, . . 3
For the best Large Purple, to George Hill, . . . 4
For the second best, to W. W. Rawson, . . . 3
For the third best, to Walter Russell, . . . 2
PUMPKINS. — For the best four specimens, not less than twenty pounds each, to A. T. Brown, . . . 3
For the second best, to W. W. Rawson, . . . 2
ENDIVE.—For the best four specimens, to Walter Russell, 4

Gratuities: —

o C. E. Richardson, for Squashes,	$1 00
W. P. Walker, for collection of Squashes,	1 00
Anthony Hatch, for Pumpkins,	1 00
Josiah Newhall, for collection of Gourds,	1 00
Harry L. Rand, " " " "	1 00
George W. Pierce, for Texan Egg Plant,	1 00
Samuel G. Stone, for Lima Beans,	1 00
George W. Pierce, for Onions,	1 00
S. A. Merrill, for collection,	4 00
W. Russell, " " of Lettuce,	1 00
W. W. Parsons, for Cranberries,	1 00
E. H. Hitchings, for Barberries,	1 00

OCTOBER 7.

AULIFLOWERS. — For the best four, to J. Cummings,	4 00
For the second best, to J. B. Moore,	3 00
ELERY. — For the best four roots, to Josiah Crosby,	4 00
For the second best, to John Fillebrown,	3 00
For the third best, to C. W. Chamberlain,	2 00
ABBAGES. — For the best Drumhead, three specimens, to J. Cummings,	4 00
For the best Red, to J. Cummings,	4 00
For the second best, to Anthony Hatch,	3 00
For the best Savoy, to J. Cummings,	4 00
For the second best, to C. M. Atkinson,	3 00
ALSIFY. — For the best twelve specimens, to G. W. Pierce,	4 00
For the second best, to W. Russell,	3 00
ORSERADISH. — For the best six roots, to W. Russell,	4 00
For the second best, to J. Fillebrown,	3 00

Gratuities: —

o George Dorr, for Burr's Corn,	2 00
John Cummings, for Hanson Lettuce,	1 00
Samuel G. Stone, for Lima Beans,	1 00
Stiles Frost, for White Wax Beans,	1 00
John Fillebrown, for collection,	3 00
C. E. Grant, " "	1 00

NOVEMBER 4.

CAULIFLOWERS. — For the best four, to Josiah Crosby,	$4 0
For the second best, to J. Cummings,	3 0
CELERY. — For the best four roots, to Josiah Crosby,	4 0
CABBAGES. — For the best Red, three specimens, to J. Cummings,	4 0
For the best Savoy, to J. Cummings,	4 0
Gratuities: —	
To C. M. Atkinson, for collection,	2 0
Josiah Crosby, for Salsify,	1 0

NOVEMBER 11.

Gratuities: —	
To Josiah Crosby, for Cauliflowers and Celery,	4 0
C. M. Atkinson, for Cauliflowers and Cabbage,	3 0
C. W. Chamberlain, for Celery,	2 0

The amount awarded to each contributor is as follows:

Alexander Anderson	$4	George Dorr	$
W. T. Andrews	2	John Fillebrown,	2
C. M. Atkinson	25	D. B. Flint	
James Bard	10	Stiles Frost	
H. C. Bowers	1	Charles Garfield	
C. H. Brackett	7	S. N. Gifford	
C. N. Brackett	68	Mrs. E. M. Gill	
A. T. Brown	10	Mrs. Mary T. Goddard	5
A. D. Capen	1	C. E. Grant	2
Miss Sabra Carter	1	J. J. H. Gregory	2
M. W. Chadbourne	17	Samuel Hartwell	2
C. W. Chamberlain	6	Anthony Hatch, Bronze	
W. C. Child	18	Medal and	
James Comley	22	Seth W. Hathaway	1
George Craft	2	George Hill	6
W. A. Crafts	4	E. H. Hitchings	
Josiah Crosby	173	O. M. Holmes	
John Cummings	107	Hovey & Co.	
C. T. Curtis	3	C. D. Kingman	
Alexander Dickinson	4	Edward Lawrence	

M. Mellen	$9	Walter Russell,	$198
A. Merrill	13	B. G. Smith	14
S. M'Intosh	1	Charles Stearns	3
hn B. Moore	34	George F. Stone	17
siah Newhall	1	S. G. Stone	2
W. Parsons	1	Edward Sumner	8
orge W. Pierce	78	Joseph Tailby	4
siah Pratt	4	J. W. Twombly & Son	5
muel Pratt	3	W. P. Walker	1
rry L. Rand	1	L. W. Weston	6
W. Rawson	12	N. B. White	2
S. Richards	3	E. M. Whitney	1
E. Richardson	1	E. W. Wood,	1
orge Russell	4	W. K. Wood,	2

nount appropriated,	$1,200 00
izes and Gratuities awarded,	1,180 00
Balance unexpended,	$20 00

REPORT

OF THE

Committee on Gardens

FOR THE YEAR 1876.

BY JOSEPH H. WOODFORD, CHAIRMAN.

The Garden Committee, in making their report, would call attention of members to the fact that active competition has a gr deal to do with the success of any society, but more particularly such an one as ours; and it is desirable that more members en places for the inspection of the Committee, thereby fostering interests of the Society and stimulating your Committee to grea exertions.

EDWARD S. RAND, JR.'S GREENHOUSE AND GRAPERY.

The first visit this year was to Glen Ridge, in May, to insp Edward S. Rand, Jr.'s Greenhouse and Grapery. The Greenho is one hundred and thirty-five feet by twenty, and is divided into f compartments to accommodate the plants from various countri The principal attraction at this time was the Stove, which was v filled with costly orchids, handsomely interspersed with fer giving the house a much more elegant appearance than either wo alone. Some of the most beautiful of the orchids in bloom w *Cattleyas* of various species, *Oncidiums*, *Vandas*, *Dendrobiums*, The other compartments of the house were well filled with plan generally in good health and very well grown, especially the *Aga* and other succulents, which were in robust health and presente very fine appearance.

On the second visit to Glen Ridge, which occurred in Septemb your Committee noticed a much smaller collection of orchids an less amount of bloom; but the house was very clean and neat, the other plants were looking finely, but more particularly

Agaves, some of which were used to decorate the grounds about the mansion.

We award Mr. Rand the second prize of thirty dollars for his Greenhouse.

Your Committee also in May visited Mr. Rand's Cold Grapery. This consists of a house one hundred feet by twenty-five, with curvilinear roof, having no inside supports, and well filled with sixty vines of the best kinds of foreign Grapes. At this visit Robert Watt was training the vines, which gave promise of an abundant crop of grapes late n the season. On our second visit, which occurred September 7th, the expectations of the spring were realized, for at this time we were regaled with well ripened grapes of a dozen or more kinds. The bunches were not extra large, but were well ripened and of delicious flavor.

We award Mr. Rand the first prize of fifty dollars, for his Grapery.

John B. Moore's Greenhouse.

In June your Committee visited John B. Moore's Greenhouses at Concord, and also in September. On both visits the Committee were particularly struck with the neatness of the houses and the cleanness of the plants. The plants grown by Mr. Moore being almost entirely for sale or for producing flowers for the florist, were noticeable as being the best varieties for those purposes. They were very thrifty and in handsome foliage, and the net result at the end of the year, from the exhibit, was very gratifying. Mr. Moore's manner of keeping over Azaleas, Hardy Roses, etc., was commended by your Committee, and we cannot do less than to bring it to the attention of the Society. The pots were plunged in coal ashes in cold frames, and kept in robust health by judicious watering and assiduous care. The stove presented a very handsome appearance, being filled with well grown young and thrifty *Caladiums*, *Dracœnas*, *Crotons*, etc., of vigorous growth and splendid foliage, giving evidence of economy in management and general thrift in result.

We award Mr. Moore the first prize of fifty dollars for his Greenhouse.

For the Committee,

J. H. WOODFORD, *Chairman*.

REPORT

OF THE

COMMITTEE ON PUBLICATION AND DISCUSSION

As the results of the work under the supervision of this Com mittee appear in the published TRANSACTIONS of the Society, would seem scarcely necessary to make an annual report. Ve briefly, we may say, that the discussions have been maintain with increasing interest. They have been practical in their characte and there can be no doubt that this free interchange of experien by practical men, will prove to be of great value to our member It seems to your Committee to be desirable to preserve this cha acteristic; to encourage discussions upon subjects connected wi the exhibitions; to draw out the methods of our most successf cultivators, and, in a generous way, to compare notes, with purpose to mutual help. But, while our main reliance is up such eminently practical methods as exhibitions, and discussio connected with them, it is also well for us to consider whether should not, to some extent, seek for help from deeper scienti investigation upon themes connected with our art. We are ful persuaded of the invaluable service which science has rendered horticulture. Our Society has wealth and position; shall it not, some extent, become the patron of science, and encourage investig tion in directions where information seems most needed? Indirectl this may be done, by establishing occasional lectures upon scienti subjects, and thus striving to make the Society the channel, throu its publications, of disseminating the results of the latest researc All will admit the advantage of keeping abreast with modern d covery, in every branch of our art; and, if we add to this consider tion the honor and increased influence which will accrue to t Society by thus publishing knowledge in our department, we sh agree that we can scarcely pay too high a price for the attainme of this end. It will therefore be the aim of the Committee duri the coming year, to secure an occasional lecture, more strict

entific than we have had in the past. And we trust and believe
at the funds of the Society, to the moderate extent which may
needed for this purpose, will not be wanting. At the present
ne your Committee ask for the appropriation of $250 for the
ming year, to meet the expense of prizes and other incidentals.
The following prizes have been awarded for Essays, which will
read during the coming season:

or the best Essay upon the Culture of the Squash and Melon, with a list of the best varieties, to J. W. Pierce, the prize of $25 00

or the best Essay upon the Improvement and Ornamentation of Suburban and Country Roads, to Daniel Denison Slade, the prize of 25 00

For the Committee,

WILLIAM C. STRONG, *Chairman.*

REPORT OF THE SECRETARY.

The duties of the Secretary during the past year have been similar to those described in my last report, as Editor, that a particular mention of them would be but a repetition of that. T chief difference has been the addition of the duties of Recordi Secretary and of Secretary of the Executive Committee. As Se retary of the Committee on exhibiting Massachusetts Fruits at t Centennial Exposition, much time was consumed in making t preliminary arrangements, and in answering inquiries concerni them, both personally and by letter, as well as in arranging (wi the other members of the Committee) the fruit in the Exposition.

When my last report was made, I hoped and expected th by this time I should be able to report the completion of t History of the Society. The review of all the exhibitions of t Society from the beginning—in some respects the most importa part of the history, as describing the chief means by which t Society has directly promoted the advancement of horticulture- has occupied more time than was anticipated. This portion of t history has been divided into three parts—the first from the found tion of the Society in 1829, to the occupation of the first Hortic tural Hall in 1845; the second from that time to the building of t present Hall in 1865; and the third from that time onward. T history of the first two of these periods has been completed, b for the reasons before mentioned, and the many calls on my tim my hope of completing the whole has been disappointed.

ROBERT MANNING, *Secretary.*

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS,

FOR THE YEAR 1876.

The Chairman of the Committee of Arrangements, agreeably to vote of the Society, passed at the regular meeting in January, 876, would respectfully submit the following report.

For a number of years past a report has not been made, owing, rhaps, to the reports of the various committees, required by the -Laws, seeming to obviate the necessity of one from the Committe of Arrangements, supplying as they do, a record of all the essenal doings of the last named committee, with the exception of minor tails, such as printing tickets, advertising, engaging music, and proving bills contracted for necessities required for the exhibitions. he Committee is divided into Sub-Committees, consisting of memrs of the Fruit, Flower, and Vegetable Committees, who have harge of the arrangement of the tables for the exhibition of the ruits, Flowers, and Vegetables, and to whose careful supervision is ving the success of the Rose Show in June, and the Annual Exbition in September.

The Committee has been called together at such times during the ar as was deemed necessary, to consult upon matters of business ncerning the exhibitions, so that they might prove successful, d worthy of the Society. The meetings have at all times been ll attended; every member has had the interests of the Society lly at heart in all the discussions of such subjects as they have en called together to act upon, and it has been no fault of theirs the exhibitions have not proved so remunerative as we could ve wished. In point of excellence they have seldom, if ever, en surpassed. The Rose Exhibition in June was universally adtted to be far superior to any previous one, and was free to the blic.

The Annual Exhibition, notwithstanding the extremely hot, d weather of Summer, and other drawbacks discouraging to t cultivator, was one of which the Society may justly feel prou It is not necessary to enter into its details here, as they will found in the full and able reports of the Fruit, Flower, and Veget ble Committees. It was opened on the 19th of September, with admission fee of twenty-five cents, and was continued four day The weather was stormy for most of the time, notwithstandi which the attendance was very large, although the receipts we small, amounting to only $450.70, the complimentary ticke having, as usual, been pretty freely distributed to membe and such persons as the Committee thought best to send the to. No pains were spared on the part of the Committee render it attractive; as proof that they succeeded in doing s all who attended will attest its having been one of the be arranged and most attractive exhibitions ever held by the Societ We wish the receipts could have been larger, and an interest tak out of the Society, such as has been shown in other cities, whe the general public seem to be more appreciative of the labors the horticulturist than in Boston. One reason for this lack enthusiasm is, perhaps, our excellent weekly exhibitions, whi have always been open to the public free of expense. O would think that these generous efforts to promote the cause horticulture, by offering such delightful and interesting displa of Fruits, Flowers, and Vegetables, every Saturday throughout t season, would awaken an interest in the public for the welfare the Society, lively and deep enough to make it liberal once in t year, thereby cheering the hearts and strengthening the hands those who have devoted their time and energies to produce exhi tions so attractive, and which never fail to reward with pleasu and instruction those who visit them.

For the Committee,

C. H. B. BRECK, *Chairman.*

REPORT

OF THE

LIBRARY COMMITTEE.

By EDWARD S. RAND, Jr., Chairman.

The steady growth of the Library has continued during the past ar. Many new and valuable books have been added, some of ich have for years been on the list of *desiderata*.

The creation of a horticultural library is not the work of a few ars, nor can it be accomplished without a liberal expenditure of ney. For many years your Committee have labored assiduously make the Library of this Society the most complete horticultural rary in the country. It has been a work requiring untiring ention, a knowledge of the value of books, and a constant quaintance with the sales of libraries on both sides of the lantic.

Botanical books are printed in small editions, soon go out of nt, and are absorbed by collections, and then rarely come to e; thus, the watching of the market to secure choice books as y may, from time to time, be offered for sale, is a most portant duty of the Committee.

From the small beginnings of the year 1856, when the Library s contained in one case, and was composed of books of but le value, up to 1869, the growth of the Library, though steady, s not rapid. During those years the funds at the disposal of Committee were not sufficiently large to allow the purchase of y expensive works, and it was deemed advisable to add to the rary cultural works, few of which were, individually, of great cuniary value. By the addition of these, however, the usefulness the library was greatly increased, and each year the members of Society more fully appreciated and availed themselves of its vantages.

In the year 1869, by the liberality of Ex-President Josi
Stickney, whose decease the Society has, the past year, be
called upon to mourn, the funds in the hands of the Committee we
so increased as to admit of the purchase, from time to time, of ma
rare and very expensive works. The possession of such volumes
Sibthorp's Flora Græca, Flora Danica, Redouté's Liliacées, Bat
man's Orchidaceæ of Mexico and Guatemala, Bury's Hexandri
Plants, Wallich's Plantæ Asiaticæ, Roxburgh's Flora Indica, a
Roxburgh's Coromandel Plants, is, of itself, sufficient to gi
importance to the library. And when we look over the Catalog
and see the titles of hundreds of books, of which probably t
only copy in this country is found in our library, the Society h
great cause for congratulation. Already, ours is the most comple
and valuable horticultural library in the country, and the past ye
has added largely to its treasures, as will be seen by a perusal
the lists annexed to this report.

Your Committee regret that they have been able to add so fe
works on Pomology. There are comparatively few illustrated wor
on fruit; all that were attainable have been purchased, and
cultural works on this subject are upon the library shelves. Yo
Committee would ask members of the Society to call attention
any deficiency of the library in this branch of horticulture; or,
fact, upon any subject connected with horticulture.

The want of room for the library is seriously felt; and, althou
additional space has been provided, it cannot be many years befo
a reconstruction of the library room will be imperatively demande
Accommodations are greatly needed for pamphlets, of which t
library contains a very valuable collection, but which, in the
present condition are not available for ready reference. T
want of a catalogue, arranged on slips, as in use in all lar
libraries, is beginning to be felt.

Your Committee would report that the appropriation of t
Society has been chiefly expended for periodicals and binding, a
would ask an appropriation of the same amount ($300) for t
year 1877. The income of the Stickney Fund has been whol
expended in the purchase of rare books. Some valuable wor
have been presented to the library, among which your Committ
would especially mention two copies of Les Promenades de Par
par A. Alphand, Paris, 1868, a magnificent work, respectively giv
by William Gray, Jr., and Francis L. Lee.

For full information as to the volumes presented, the additions o the library during the past year, and the periodicals subscribed or by the Society, reference may be had to the lists accompanying his report. Your Committee refer with great pleasure to the ssistance that has been derived from the constant attention of the ibrarian, Edwin W. Buswell, to all matters appertaining to the brary. It is owing to his uniform courtesy that the library is ade so accessible and useful to the members, and his constant ttention to the wants of those visiting the library room in search f botanical information conduces much to the usefulness of the ociety.

LIBRARY ACCESSIONS IN 1876.

Books Purchased.

uhamel du Monceau. Traité des Arbres et Arbustes. 2d edition. 7 vols. folio, 488 colored plates. Paris: 1801–19.

t. Hilaire, Jaume. La Flore et la Pomone Françaises. 6 vols. royal 4to., 544 colored plates. Paris: 1828–33.

feiffer, L. Nomenclator Botanicus. 4 vols. 8vo. Cassellis: 1873–4.

awson's Pinetum Britannicum. Folio. Nos. 34 and 35, to complete the work.

oott, Francis, M. D. Illustrations of the Genus Carex. 4 vols. folio, 600 plates. London: 1858–67.

ulasne, Louis-René and Charles. Fungi Hypogæi. Histoire et Monographie des Champignons Hypogés. Folio, 21 plates, partly colored. Paris: 1851.

ndlicher, Stephanus. Genera Plantarum. Royal 8vo. Vindobonæ: 1836–40.

——— ———. Synopsis Coniferarum. 8vo. Sangalli: 1847.

nited States and Mexican Boundary Survey. 3 vols. 4to. Many plates. Washington: 1857–59.

ltckiger, Friedrich A. and Daniel Hanbury. Pharmacographia: A History of the principal Drugs of Vegetable Origin in Great Britain and British India. 8vo. London: 1874.

assard, Annie. Floral Decorations for the Dwelling-house. 12mo. New York: 1876.

ay, Thomas. American Entomology. Vol. 1, to complete the set. 8vo., 18 colored plates. Philadelphia: 1824.

Sullivant, William S. Icones Muscorum: Supplement. Royal 8vo 81 plates. Cambridge, Mass., and London: 1874.

Mohr, Frederick. The Grape Vine, its Management, etc. Trans lated by Charles Siedhof. 12mo. New York: 1867.

Bentham, George, and J. D. Hooker. Genera Plantarum ad Exem plaria imprimis in Herbariis Kewensibus servata definits Vols. 1 and 2, royal 8vo. London: 1862–1876.

——— ——. Review of the Order of Hydrophylleæ. 4to pamphlet, plate. 1834.

——— ——. On the Heliamphora Nutans. 4to. pamphlet. 1840

——— ——. On African Anonaceæ. 4to. pamphlet, 5 plates 1862.

Brewer, W. H., Sereno Watson, and Asa Gray. Botany of Cal fornia. Vol. 1. Uniform with the publications of the Geo logical Survey of California. 4to. Cambridge: 1876.

Koch, K. Dendrologie. 2 vols. 8vo. Erlangen: 1869–1872.

Beddome, R. H. Icones Plantarum Indiæ Orientalis, or New an Rare Plants from Southern India and Ceylon. Vol. 1, 4to. 300 colored plates. Madras: 1874.

——— — —. Ferns of Southern India. 4to., 271 plates Madras: 1873.

Lettsom, J. C. Natural History of the Tea Tree. 4to. London 1799.

Pallas, P. S. Illustrationes Plantarum. Folio, 59 colored plates Lipsiae: 1803.

Masson, F. Stapeliæ Novæ. 4to., 41 colored plates. London 1796.

Lunan, John. Hortus Jamaicensis. 2 vols. 4to. St. Jago de l Vega: 1814.

Oliver, Daniel. Illustrations of the Vegetable Kingdom. Oblon 4to., 109 plates. London: 1874.

Decaisne, J. Le Jardin Fruitier du Museum. Parts 101–121, i continuation. Imperial 8vo. Paris.

Hooker, J. D. Flora of British India. Vol. 1, 8vo. London 1875.

Saunders, Wilson W. Refugium Botanicum. Vol. 1, Parts 1–3 Vol. 2, Part 1; Vol. 3, Parts 1–3; Vol. 4, Parts 1–3; Vol 5, Parts 1, 2; "all published." 8vo., many plates, partl colored. London: 1868–72.

Seeman, Berthold. Journal of Botany, British and Foreign. 1 vols. 8vo. London: 1863–74.

Cavanilles, Ant. Josephus. Icones et Descriptiones Plantarum in Hispania Crescunt. 6 vols. folio, 600 plates. Matriti: 1791–1801.

Crew, C. J., G. D. Ehret and B. C. Vogel. Plantæ Selectæ Londini in Hortis. 100 colored plates. Nuremberg: 1750–73. Also, Plantæ et Papiliones rariores: 18 colored plates, by G. D. Ehret. Heidelberg: 1748. 1 vol. folio.

Catesby, Mark. Natural History of Carolina, Florida, and the Bahama Islands, with descriptions in English and French. 2 vols., folio, 220 colored plates. London: 1771.

Eland, Edward S., Jr. Orchids, a description of the Species and Varieties grown at Glen Ridge, with lists of other desirable kinds. 8vo. New York: 1876.

Roosevelt, Robert B. Five Acres Too Much. 12mo. New York: 1869.

Johnson, Joseph Forsyth. The Natural Principles of Landscape Gardening. Royal 8vo., 10 plates. Belfast: 1874.

Saltet, Charles. The Art of Grafting and Budding. Small 8vo., many wood-cuts. London: 1873.

Silcock, Randal H. Botanical Names for English Readers. 8vo. London: 1876.

Descourtilz, M. E. Flore Pittoresque et Médicale des Antilles, etc. 8 vols. 8vo., 600 colored plates. Paris: 1827–33.

Baillon, H. Histoire des Plantes. 8vo. Parts 48–53, in continuation.

Candolle, Alph. de. Géographie Botanique. 2 vols., 8vo. Paris et Genève: 1855.

Salm-Dyck, Jos. de. Monographia generum Aloes et Mesembryanthemi. 3 vols. 4to., many plates. Bonnæ: 1836–63.

——— ——— —. Hortus Dyckensis. 8vo., 3 plates. Dusseldorf: 1834.

——— ——— —. Cactæ in Horto Dyckensi cultæ anno 1849. 8vo. Bonnæ: 1850.

Jacquin, Nicolaus Josephus. Plantarum Rariorum Horte Cæsarei Schoenbrunnensis. 4 vols. in 3, folio, 500 colored plates. Viennæ: 1797–1804.

——— ——— ———. Genitalia Asclepiadearum Controversa. Small 8vo. Viennæ: 1811.

Cooke, M. C. A. Manual of Structural Botany. 16mo., 215 wood cuts. London: 1870.

Green, Francis H., and Joseph W. Congdon. Analytical Cla
Book of Botany. Small 4to., many wood-cuts. New Yo
and London: 1859.

United States Exploring Expedition under Charles Wilkes in 183
1842. Vol. 15. The Geographical Distribution of Anima
and Plants, by Charles Pickering, M. D. Part 1.—Histo
of the Introduction of Animals and Plants. Royal 4t
Boston and London: 1863.

Pickering, Charles. The Geographical Distribution of Animals an
Plants. Part 2.—Plants in their Wild State. Royal 4t
Salem: 1876.

Journal of the Royal Agricultural Society for 1876. Second Serie
vol. 12, 8vo. London: 1876.

Du Breuil, A. Vineyard Culture, with notes by J. A. Warde
12mo., 144 wood-cuts. Cincinnati: 1867.

Morren, Charles and Édouard. Belgique Horticole. 25 vols. 8vo
many colored and other plates. Liege: 1851–75. Sti
publishing.

Darwin, Charles. The Movements and Habits of Climbing Plant
12mo. New York: 1876.

Transactions of the Academy of Science of St. Louis. Vols. 1 an
2, 8vo., plates. St. Louis: 1857–68.

Fraser, Hugh. Handy Book of Ornamental Conifers, Rhododen
drons, etc. Small 8vo. London: 1875.

Brown, James. The Forester. 2d ed., enlarged. 8vo. London
1851.

Sinclair, George. Hortus Gramineus Woburnensis. 3d ed., larg
8vo., many colored plates. London: 1826.

Brandis, Dietrich. The Forest Flora of North-west and Centra
India. 8vo. London: 1874.

Baker, J. G. Elementary Lessons in Botanical Geography. 12mo
London: 1875.

Murray, Andrew. The Pines and Firs of Japan. 8vo., 224 wood
cuts. London: 1863.

Just, Dr. Leopold. Botanischer Jahresbericht. Zweiter Jahrgan
(1874), Zweite Abtheilung. 8vo. Berlin: 1875.

Hooker, J. D. Flora of Australia, an Introductory Essay to th
Flora of Tasmania. 4to. pamphlet. London: 1859.

Lubbock, Sir John. On the Origin and Metamorphoses of Insects
Small 8vo., many wood-cuts. (Nature Series.) London
1874.

ubbock, Sir John. On British Wild Flowers, considered in relation to Insects. Small 8vo., many wood-cuts. (Nature Series.) London: 1875.

mith, C. Roach. The Rural Life of Shakspeare as illustrated by his works. 8vo. pamphlet, 2d ed. London: 1874.

lorsfield, Thomas. J. J. Bennett and R. Brown. Plantæ Javanicæ rariores. Folio, 50 colored plates. London: 1838.

lortus Collinsonianus. An account of the Plants cultivated by the late Peter Collinson. 8 vo. pamphlet. Swansea: 1843.

logg, Robert. The Dahlia. 8vo. pamphlet, 9 colored plates. London: 1853.

alfour, Edward. The Influence of Trees in producing rain, etc. 8vo. pamphlet, pp. 401–474. [Madras: 1849?]

rooke, James & Co. The Fairfield Orchids. 8vo. London: 1872.

uccarini, Dr., Prof. Grisebach, Carl Nägeli, and H. F. Link. Reports and Papers on Botany. 8vo., 7 plates. Printed for the Ray Society. London: 1846.

inaceæ: a Handbook of the Firs and Pines. By "Johannes Senilis." 8vo. London: 1866.

eichenbach, Prof. H. G. Enumeration of Orchids collected in the neighborhood of Moulmein. 4to. pamphlet, 6 plates. 1873.

lemoirs of the Philadelphia Society for Promoting Agriculture. 5 vols. 8vo. Philadelphia: 1815–1826.

wartz, Olai. Synopsis Filicum. Adjectis Lycopodineis. 8vo., 5 plates. Kiliae: 1806.

inetum Woburnense: a Catalogue of Coniferous Plants in the collection of the Duke of Bedford at Woburn Abbey. Imperial 8 vo., 67 colored plates. 1839. [Nôt published.]

rownius, Robertus. Prodromus Florae Novae-Hollandiae et insulae Van-Diemen. Small 4to. Norimbergae: 1827.

unal, Mich. Félix. Histoire Naturelle, Médicale, et Économique des Solanum, etc. 4to., 26 plates. Paris: 1813.

ussey, Mrs. T. J. Illustrations of British Mycology. 4to., 90 colored plates. London: 1847. Second series, 50 colored plates. London: 1855.

indley, John. The Genera and Species of Orchideous Plants, with drawings by Francis Bauer. 4to., 24 colored and 10 uncolored plates. London: 1830–38.

Lindley, John. Sertum Orchidaceum, a Wreath of the most beauti
Orchidaceous Flowers. Folio, 50 colored plates. Londo
1838.

Martius, Carol. Frid. Phil. de. Historia Naturalis Palmaru
2 vols. large folio. Vol. 1, text; vol. 2, 238 colored plat
Lipsiae: 1823–1848.

Bentley, Robert, and Henry Trimen. Medicinal Plants. 15 part
8vo., colored plates. London: 1875–6. To be completed.

Lea, Rev. William. Small Farms for Fruit Growing. 16m
London: 1872.

Scott, John. The Orchardist, or Catalogue of Fruits cultivat
at Merriott, Somerset. 8vo. London: no date.

Coultas, Harland. What may be learned from a Tree. 8v
New York and London: 1860.

The following named books have been ordered, but were n
received at the time of printing this report:

Balfour. Timber Trees, Timber, and Fancy Woods; also, T
Forests of India and of Eastern and Southern Asia.

Forbes. Hortus Ericaceus Woburnensis.

Bentham. New species of Tropical Leguminosæ.

Lindley. List of the Orchidaceous Plants of East Cuba.

———. Contributions to the Orchidology of India.

Tracts: on Transplanting Evergreens and Large Deciduous Tree
by Stuart; Canker in Fruit Trees; Diseases of Plants; U
of Salt as a Manure, etc, bound in one volume.

Transactions of the Scottish Arboricultural Society of Edinburgh

Williams' Stove and Greenhouse Plants. New edition.

Bosson. Les Plantes Bulbeuses.

Piper, R. U. The Trees of America.

Fowler, J. H. Orange Culture.

Morren, Prof. Directory of Botanists.

Hooker, W. J. Jungermanniæ.

BOOKS AND PAMPHLETS PRESENTED.

Alphand, A. Les Promenades de Paris: Bois de Boulogne et
Vincennes, Champs Elysées, Parcs, Squares, Boulevard
Places Plantées. 2 vols., large folio, 487 wood cuts, 80 ste
plates, and 23 chromoliths. Paris: 1868–72. Willia
Gray, Jr.

Another copy from Francis L. Lee.

Major, Joshua. The Theory and Practice of Landscape Gardening. 4to., plates and cuts. London: 1852. E. H. Hitchings.

Busby, James. Grapes and Wine. A Visit to the principal Vineyards of Spain and France. 12mo. New York: 1848. E. H. Hitchings.

Bulletin de la Société Centrale d' Horticulture du Départment de la Seine-Inferieur. Tome 18, Parts 1 and 2, 8vo. pamphlets. Rouen: 1876. The Society.

Transactions of the Worcester County Horticultural Society for 1875. 8vo. pamphlet. John C. Newton, Librarian and Treasurer.

Proceedings of the New Jersey State Horticultural Society at its Annual Meeting held in New Brunswick, January 20th and 21st, 1876. 8vo. pamphlet. E. Williams, Recording Secretary.

Transactions of the Wisconsin State Horticultural Society. Vol. 6, 8vo. 1876. F. W. Case, Secretary.

Downing, Charles. Second Appendix to the Second Revised Edition of the Fruits and Fruit Trees of America. 8vo. pamphlet. New York: 1876. The Author.

Bivort, Alexander. Les Fruits du Jardin Van Mons. 8vo. Bruxelles: 1868. The Author.

Proceedings of the Fifteenth Session of the American Pomological Society held in Chicago, Ill., September, 1875. 4to. pamphlet. 4 copies. Marshall P. Wilder, President.

Third Annual Report of the Maine State Pomological Society for 1875. 8vo. pamphlet. George B. Sawyer, Secretary.

Report of the Pennsylvania Fruit Growers' Society for 1875. 8vo. pamphlet. E. B. Engle, Secretary.

Fruit List of the Province of Quebec, by the Fruit Growers' Association of Abbotsford. 8vo. pamphlet. J. D. Gibb.

First Report of the Fruit Committee of the Montreal Agricultural and Horticultural Society, June, 1876. The Society.

Thirteenth, Fourteenth, Fifteenth, and Sixteenth Annual Reports of the Baltimore Park Commission. 4 pamphlets, 8vo., with map. Baltimore: 1873–76. The Commission.

Report on the Establishment of a Public Park. 8vo. pamphlet. Boston: 1874. William Gray, Jr., Commissioner.

First, Second, and Third Reports of the Board of Commissioners of the Department of Parks for the City of Boston. 8vo., with maps. 1876. William Gray, Jr., Commissioner.

Report of the South Park Commissioners, Chicago, for the year 187

Acts of the Assembly, etc., relating to South Park, 1869, 1875.

Sidway, L. B., Chairman of the Horticultural Department of Sou
Park Commission. Report for five years ending March 31s
1876. 3 pamphlets, 8vo. H. W. Harmon, Secretary of t
Commission.

Second Annual Report of the Commissioners of Central Park, Ne
York. 1859.

Eleventh Annual Report of the same. 1868. 2 pamphlets, 8v
W. O. Ross.

Report of the United States Department of Agriculture for 187
8vo. The Department.

List of the Agricultural and Horticultural Societies, Farmers' Clu
and Agricultural Colleges on the books of the Departme
of Agriculture, July 4, 1876. 8vo. pamphlet. Washingto
1876. The Department.

Report of the Board of Commissioners on the Irrigation of the Sa
Joaquin, Tulare, and Sacramento Valleys of Californi
8vo., with maps. Washington: 1874. Hon. R. S. Frost

Colman, Henry. Fourth Report on the Agriculture of Massach
setts. 8vo. 1841. Edward S. Davis.

Twenty-third Report of the Secretary of the Massachusetts Boa
of Agriculture for 1875. 8vo. C. L. Flint, Secretary.

Ninth Annual Report of the Connecticut Board of Agricultur
1875–6. 8vo. T. S. Gold, Secretary.

Fourth Annual Report of the State Board of Agriculture of Kans
for 1875. 8vo. Alfred Gray, Secretary.

Massachusetts Agricultural Repository, Vol. 10, Parts 3 and 4,
complete the set. 2 pamphlets, 8vo. Boston: 183
Bussey Institute.

Transactions of the New York State Agricultural Society, Vol.
for the year 1841, to complete the set. 8vo. Albany: 184
The Bussey Institute.

Proceedings at the First Annual Convention of the New York Sta
Dairymen's Association, 1872. 8vo. pamphlet. 1873.
Wetherell.

Transactions of the Wisconsin State Agricultural Society, Vol. 1
1875–6. 8vo. W. W. Field, Secretary.

Transactions of the Hingham Agricultural and Horticultural Socie
for the year 1875. 8vo. pamphlet. Fearing Burr, Corre
ponding Secretary.

Transactions of the Rhode Island Society for the Encouragement of Domestic Industry. 1874. 8vo. pamphlet. Joseph S. Pitman, Secretary.

Bulletin of the Bussey Institution. Part 5, to complete Vol. 1. 8vo. pamphlet. F. H. Appleton, Librarian.

Thirteenth Annual Report of the Massachusetts Agricultural College. 8vo. pamphlet. W. S. Clark, President.

Report of the Curators of the University of Missouri, etc., for 1875. 8vo. pamphlet. G. C. Swallow.

Report of the New Hampshire College of Agriculture and the Mechanic Arts, for 1875.

Catalogue of Dartmouth College, 1875–6. 2 pamphlets, 8vo. Rev. A. D. Smith, President.

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Floral Magazine.
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Journal of the Linnean Society.
Journal of Botany.
Farmer's Magazine.
Country Gentleman's Magazine.
Journal of the Royal Agricultural Society.
French.—Révue Horticole.
Belgian.—Illustration Horticole.
Flore des Serres.
Belgique Horticole.
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American Agriculturist.
Country Gentleman.
Rural Carolinian.
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American Naturalist.

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New England Farmer.
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Boston Cultivator.
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Daily Evening Traveller.
Boston Morning Journal.
The Nursery.
The Cottage Hearth.

TREASURER'S REPORT,

FOR THE YEAR 1876.

ITEMS OF INCOME.

Balance of Cash on hand,	$416 64
Received of William Gray, Jr., to pay prizes for 1875,	85 00
" from Rent of Stores,	12,433 28
" " " Halls,	5,563 60
" " Admissions and Assessments,	1,332 00
Gross Receipts of Annual Exhibition,	450 75
Borrowed on call,	11,000 00
Sundries,	30 50
	$31,311 77

ITEMS OF EXPENDITURE.

Salaries of Treasurer, Secretary, and Chairmen of Committees,	$3,400 00	
Library Accessions,	765 80	
Heating and Water, less paid by tenants,	477 52	
Stationery, Postage, and Printing,	1,632 24	
Alterations and Repairs on Building,	550 78	
Gas,	987 04	
New Furniture and Repairs,	315 90	
Expenses of Annual Exhibition,	956 13	
Expenses of Rose Show,	73 15	
Taxes,	3,429 00	
Interest,	3,087 08	
Insurance,	1,517 25	
Bust of President Parkman,	200 00	
Portrait of Dr. Bigelow,	580 00	
Expenses of Centennial Exhibition,	340 81	
Balance of Prizes for 1875,	4,733 50	
Deposited to pay Prizes of 1876,	6,000 00	
Incidental Expenses,	2,035 68	
Balance carried to new account,	229 89	
		$31,311 77

BOSTON, January 5, 1877.

We have examined the foregoing account and found it correc and the balance of cash on hand, two hundred and twenty-ni dollars and eighty-nine cents, as stated.

[Signed] C. O. WHITMORE, H. H. HUNNEWELL, B. P. CHENEY, } *Finance Committee.*

ASSETS AND LIABILITIES.

ASSETS.

Real Estate, Furniture, and Exhibition Ware, costing		$256,415
Add for Rose Boxes and Card Clasps,		170
		$256,585
Library, last year,	$14,795 60	
Paid this year,	765 80	
		15,561
Bonds of C., B. & Q. R. R., par value,		1,500
Total,		$273,646

LIABILITIES.

Mortgage debt at 5½ per cent., payable September, 1883,	$60,000 00	
Loan without interest, payable to Harvard College in 1899,	12,000 00	
Floating Debt,	11,000 00	
		$83,000
Balance of assets over liabilities,		$190,646

By last year's Report our membership numbered			1,085
Of these were Life Members,	577		
Added by election,	18		
Added by commutation,	2		
	597		
Deceased,	10		
		587	
Annual Members,	482		
Added,	11		
	493		
Commuted, 2			
Deceased, 10			
Discontinued for non-payment, 55			
Withdrawn, 5			
—	72		
		421	
			1,008

Income from the above:	
18 Life,	$540 00
11 Annual,	110 00
2 Commuted,	40 00
321 Subscriptions,	642 00
	$1,332 00

The foregoing requires a few words of explanation. The hard times so long dreaded, culminating in a reduction of rents, and no income from Mount Auburn Cemetery, have lessened our resources, while our expenditures have not been correspondingly reduced. We have not only paid a balance of over five thousand dollars of prizes awarded in 1875, but have fully provided for those of this year, necessitating a loan on call of eleven thousand dollars. I believe this to be only a temporary condition of affairs. Present indications point to a better financial condition in the coming year.

The causes before named have also affected our membership. A larger number than ever before of our subscription members have been discontinued for non-payment, and a few have withdrawn honorably. Our ranks are kept full by the addition of life members. So much as Treasurer.

As Librarian and Superintendent, a few words. I would add to

what has been said in the report of the Library Committee, th
although the expenditure is not equal to the appropriation, t
books purchased to arrive will make that account all right ne
year. I only wish the library could be made more valuable
more frequent and constant use. It is to-day the best of its ki
in the world, but is beneficial only in proportion as it is consulted

Our stores are as desirable as ever, and our halls have lost not
ing of their prestige.

The visitors to our rooms for the use of the library and for m
tual intercourse, increase in numbers year by year to a degree tru
encouraging. Friends of horticulture abroad will please accept
invitation to make our rooms their headquarters while in this cit
Our members, of course, need no invitation.

E. W. BUSWELL, *Treasurer.*

MOUNT AUBURN CEMETERY.

The following accounts between the Society and the Proprietors of the Cemetery of Mount Auburn are printed as presented by the Treasurer of the latter corporation.

Dr. *Massachusetts Horticultural Society, in account with the Proprietors of the Cemetery of Mt. Auburn.* **Cr.**

For Sales and Improvements within the Cemetery, for the year ending Dec. 31, 1876.

Cost of filling up and improving land at Mt. Auburn, unsalable or unfit for burial purposes, and expenditure on account of New Receiving Tomb for the year ending Dec. 31, 1876; the Mass. Horticultural Society being charged with their proportion of the same.			By Sales in January,		
Grading between Althea and Clethra Paths,	$420 97		" " " February,	$650 00	
" " Spruce and Mound Avenues,	223 28		" " " March,	525 00	
" near Halcyon Lake,	635 69		" " " April,	815 00	
" on Fountain Avenue and near Lime,	1,359 00		" " " May,	1,671 00	
" land on Stone Farm,	8,643 65		" " " June,	2,512 00	
Expended on New Receiving Tomb.	9,539 93		" " " July,	1,968 00	
			" " " August,	722 50	
One-quarter of	$20,822 52	$5,205 63	" " " September,	2,648 00	
Amount paid Town of Watertown for Taxes and Expenses,	594 20		" " " October,	1,112 00	
Amount paid Town of Watertown for permit to use lands for burial purposes,	2,500 00		" " " November,	1,717 00	
Amount paid H. W. Paine's bill, services,	40 00		" " " December,	918 00	
				371 00	
One-quarter of	$3,134 20	783 55		$15,649 50	
		$5,989 18	Less paid for Lot and Graves repurchased,	654 00	
				$14,995 50	
Balance brought forward,		2,590 31	Deduct for Annual Expenses as per Charter,	1,400 00	
			Mass. Horticultural Society, one-fourth part of	$13,595 50	$3,398 87
			Balance carried to new account,		2,590 31
					$5,989 18

E. & O. E.

H. B. MACKINTOSH, *Treasurer.*

BOSTON, December 30, 1876.

MOUNT AUBURN CEMETERY CORPORATION,
Office, No. 16 PEMBERTON SQUARE.

BOSTON, January 1, 1877.

To the Finance Committee of the Mass. Hort. Society:

GENTLEMEN,—Herewith please find account for the year 1876, showing a balance to the *debit* of the Massachusetts Horticultural Society of $2,590.31.

To account for this unusual result you have only to refer to the sales for the past year, which have been very much less than previous years; and on the opposite side of the account you will observe we have expended on the new receiving tomb $9,539.98, and in grading the "Stone Farm" and preparing land for sale, $8,643.65, besides the amount paid the Town of Watertown for the right of using lands for burial purposes.

These expenditures have had the unanimous approval of the Board of Trustees, as matters of necessity and conducive to the best interest of all concerned.

Very respectfully, your obedient servant,

H. B. MACKINTOSH, *Treasurer.*

MASSACHUSETTS HORTICULTURAL SOCIETY,

To the Proprietors of the Cemetery of Mount Auburn, *Dr.*

For one-fourth (¼) part of the following expenditures for grading lands and building New Receiving Tomb, during 1876:

June 30.	*Grading, between Althea and Clethra Paths.*		
116½ days,	man's labor,	$217 97	
58 "	man and horse,	203 00	
			$420 97
June 30.	*Grading, between Spruce and Mound Avenues.*		
74¾ days,	man's labor,	140 16	
23¾ "	man and horse,	83 12	
			223 28
July 31.	*Grading, near Halcyon Lake.*		
248½ days,	man's labor,	465 94	
48½ "	man and horse,	169 75	
			35 69
Dec. 26.	*Grading, on Fountain Avenue near Lime.*		
442 days,	man's labor,	828 75	
151½ "	man and horse,	530 25	
			1,359 00
	Amount carried forward,		$2,638 94

Amount brought forward,			$2,638 94
Grading land on Stone Farm, and filling large hollow on line of Old Stockade Fence.			
March 31.			
James Brown's bill, hauling and filling 740 yards,		$148 00	
S. Dunwoody's " " " " 2,432 "		486 40	
Dec. 16.			
1,914 days, man's labor,		3,588 75	
1,263 " man and horse,		4,420 50	
			8,643 6
Dec. 26.	*New Receiving Tomb.*		
6,000 face brick,	at $20 per M,	120 00	
144,500 hard brick,	" 8 " "	1,156 00	
100 soft brick,	" 7 " "	70	
105¾ tons granite foundation stone, at $2 per ton,		211 50	
195 bbls. cement,	at $1.50,	292 50	
14½ " lime,	" 1.10,	15 95	
91 loads sand,	" .60,	54 60	
Cook, Rymes & Co.'s bill, iron gates,		492 00	
Bowker, Torrey & Co.'s bill, marble doors (catacombs),		659 60	
Blessington & Co.'s bill, granite curbing,		75 00	
Smith & Lovett's bill, ventilators and expressage,		55 75	
W. J. McPherson & Co.'s bill, stained window,		50 50	
T. F. McGann's bill, brass handles,		140 00	
Parkers & Barnes' bill, asphalt and labor,		131 14	
N. W. Turner & Co.'s bill, gas fixtures,		110 00	
Cambridge Gas Light Co.'s bill, piping from street,		161 30	
G. F. Dickson's bill, gas fitting,		32 76	
Morse & Whyte's bill, brass wire netting,		8 00	
25,260 square feet of sods,	at 2¼ cts. per ft.,	568 35	
9¾ cords manure,	at $10.00 per cord,	93 75	
1,144 lbs. of lead,	" .07¼ " lb.	82 94	
26¾ lbs. brass wire, 3-16,	" .42 " "	11 24	
Brass for washers to handles,		1 24	
Rubber fenders for gates, and hardware,		1 94	
Padlock,		1 87	
Bolts, screws, keys, and hardware,		2 95	
12 feet brass chain (window),		1 50	
M. C. Warren's bill, 1 brass pulley,		42	
1 keg nails for centres, and 20 lbs. wro't nails,		4 70	
2 bars iron, 1½x5-16, 47 lbs.; and 72 lbs. ¾ in.,		2 94	
A. S. Trier's bill, hardware,		99	
Kohr & Ripley's bill, iron grating and express,		20 85	
A. McDonald's bill, marble and stone cutting,		116 36	
Amounts carried forward,		$4,679 34	$11,282 5

Amounts brought forward,			$4,679 34	$11,282 59
Dec. 26.				
J. W. Grigg's bill, 810 feet slate fronts, and 2,578.5 square feet slate shelves,			1,248 49	
Lumber for centres, frames, etc.:				
2,208 ft. pl'd boards, $55.20; 403 ft. spruce, $6.45,				
851 " sheathing, $34.24; 1,609 ft. pl'd pine bd's, $38.62; 142 ft. 2x8 spruce, $2.27; 259 ft. spruce, $4.15; 59 ft. 4x6 spruce, $1; 119 ft. spruce, $1.76; 401 ft. hard pine, sawed, $21.85; 51 ft. spruce, .82; 91 ft. 3 in. plank, $4.85; 405 ft. pl'd boards, $8.91; sawing, 30c.,			180 42	
Sherburne & Co., bill for lights,			5 00	
Hutchinson & Rogers, bill for canvas,			43 85	
R. & W. Sherburne's bill for glass,			5 68	
Paints and Oils:				
7 lbs. Paris Green, $2.94; spirits turp'e, benzine, &c., $2.25; 2 galls. alcohol, $6; 2 galls. linseed oil, $1.25; 60 lbs. mixed red paint, $12,			24 44	
23¾ days carpenter on centres, window, &c.,	$2.75,		63 94	
617½ " masons,	2.87½,		1,774 59	
52½ " man, tending,	2.87½,		150 21	
48¾ " painting and cleaning,	2.00,		97 50	
384¼ " labor,	1.87½,		720 47	
156 " man and horse,	3.50,		546 00	
				9,539 93
Total amount for 1876,				$20,822 52
One-fourth is				$5,205 63

MT. AUBURN, Dec. 30, 1876.

J. W. LOVERING, *Sup't.*

I certify the foregoing to be a true copy of accounts of improvements for the year 1876, rendered by the Superintendent.

H. B. MACKINTOSH, *Treasurer.*

[COPY.]

WATERTOWN, Feb. 4, 1876.

PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN.

TO TOWN OF WATERTOWN.

Williams Lot.	
Taxes and expenses of sale for 1872,	$90 85
Interest to date,	14 77
Recording deed, $1.15; drawing release, $2,	3 15
Taxes for 1873, and interest to date,	133 90
" " 1874, " " "	135 67
Amount carried forward,	$378 34

Amount brought forward,	$378
Chant Lot.	
Taxes for 1874, and interest to date,	38
Taxes on Williams and Chant Lots for 1875, and interest,	152
	$569
Add ¼ charges of E. R. Hoar, Referee,	25
Total,	$594

Rec'd Pay't, Town of Watertown.

By JOHN B. GOODRICH,
Att'y for Town.

Approved:
I. M. SPELMAN, *Pres't.*

[COPY.]

Know all Men by these Presents, that the Town of Watertown, by it Selectmen, thereto duly authorized by vote passed at a town meeting hel on the sixth day of March, 1876, in consideration of the sum of twenty five hundred dollars ($2500), to it paid by the Proprietors of the Cemeter of Mount Auburn, the receipt of which is hereby acknowledged, hereb permits the use for the purposes of burial of all the lands in said Tow included within the present enclosure of the Cemetery of said Corpor tion. A plan of the lands referred to has been filed in the Registry Deeds of the County of Middlesex, Southern District.

Dated this ninth day of June, 1876.

The Town of Watertown by its Selectmen.

W. H. INGRAHAM.
OLIVER SHAW.
H. W. MACRUDY.
N. C. SANGER.
WARD M. OTIS.

Approved for $2500.
I. M. SPELMAN, *Pres't.*

[COPY.]

BOSTON, April 13, 1876.

PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN.

To H. W. PAINE, DR.

To services in the matter between you and Watertown, before Judge Hoar, Referee, $40

Approved:
I. M. SPELMAN, *Pres't.*

REPORT

OF THE

COMMITTEE ON THE CENTENNIAL EXPOSITION.

The Committee appointed to co-operate in the International Exposition at Philadelphia, report as follows:

Early in the season a circular was prepared by the Committee setting forth the object of their appointment, and soliciting contributions of fruit to be sent to the Society's Hall, to be forwarded thence to the Centennial Exposition and displayed at the expense of the Society. Copies of this circular were sent freely to every Agricultural and Horticultural Society and Farmers' Club throughout the State, and also to Agricultural and Horticultural Journals and individuals interested in fruit growing. The response to this circular was not equal to the hopes of the Committee, but a single Society—the influential and active Worcester County Horticultural Society—and a few individuals outside of the regular contributors to our own exhibitions, taking part in the Exposition. As soon as the possibility of this result was foreseen, increased exertions were made to secure contributions from those who could be reached by personal application, and the display finally made was agreed by all, especially when the predominance of the manufacturing and commercial interests are taken into consideration, to be highly creditable to the State. The number of dishes of pears exhibited was 863, apples 214, grapes 18, making a total of 1095 dishes—a much larger number than were shown at our own Annual Exhibition. The Committee were surprised to find the number of dishes of pears from Massachusetts greater than from all the other States together, affording new proof that no part of our country is more favorable for the growth of this fruit than Eastern Massachusetts.

The Committee congratulate the Society and the State on the commendable exhibit they made in the great Exposition, showing the very deep interest felt in Pomology, and particularly in the growth of the pear. Undoubtedly the show of apples would have

been hardly less extensive than that of pears, had the Weste parts of the State contributed as liberally as the Eastern, where t apple is not so extensively cultivated. As an exposition of t pomological products of our State, your Committee feel that t part taken by our Society has resulted in bringing out a mu greater show than would probably have been gathered togeth without its aid.

The exhibition, as a whole, though certainly not all that it mig have been, has probably never been equalled in extent in a country. The whole number of dishes of fruit shown was fifte thousand. The largest similar exhibition previously made in th country was that of the American Pomological Society at Chicag in 1875, when about six thousand dishes were shown. The mo prominent feature of the exhibition was the profuse display apples from Kansas, Nebraska, Iowa, and other Western State Kansas making also a grand exhibition of fruit in the State buildin The collection of fifty-six varieties of plums from Ellwanger & Barr of Rochester, N. Y., was such as is not often seen in these day The only place beyond the limits of the United States from whi fruit was sent was Canada. The Canadian crab and other apples we remarkable for high color, and the show of plums was also exte sive and beautiful. The largest show of peaches was from Michiga Some idea of the exhibition may be formed by those who witnesse the show made here in 1873 by the American Pomological Societ and bearing in mind that the Pomological Building at the Centenni was nearly two hundred feet square, covering four-fifths of acre — about eight times the area of our larger hall — and that t greater part of the sixty tables which filled this immense spa were crowded with fruit.

The whole amount expended out of the appropriation of $1,0 is $340.81.

The names of the contributors from Massachusetts, with t number of dishes of apples, pears, and grapes exhibited by eac are as follows:

Marshall P. Wilder, Boston, . .	300 pears.	
Hovey & Co., Cambridge, . .	175 "	
C. E. Richardson, Cambridge, . .	20 "	
Joseph H. Fenno, Revere, . .	44 "	42 apples.
Benjamin G. Smith, Cambridge, .	47 "	27 "
Alexander Dickinson, Cambridgeport,	50 "	

John Cummings, Woburn,	33 pears.	27 apples.
J. W. Manning, Reading,	3 "	24 "
Simon Lamprell, Marblehead,	9 "	3 "
C. E. Grant, Boston Highlands,	8 "	
Griffin & Dolan, Cambridgeport,	16 "	
A. S. M'Intosh, Boston Highlands,	8 "	
Charles F. Curtis, Jamaica Plain,	17 "	
Josiah Newhall, Lynnfield,		15 "
F. & L. Clapp, Dorchester,	30 "	
Amos Bates, Hingham,	13 "	
Mrs. Sarah D. Fisk, Hingham,	10 "	
Samuel Hartwell, Lincoln,		18 "
Robert Manning, Salem,	35 "	
Charles H. Allen, Salem, Orange pears from a tree 235 years old,	1 "	
William Endicott, Danversport, Endicott pears, from the tree planted by his ancestor, Governor Endicott in 1630,	1 "	
John Pickering, Salem, Warden pears, from a tree grafted April 19, 1775,	1 "	
Ezekiel Doane, Eastham, Fall pears, from the tree planted by Governor Prince, as early as 1650,	1 "	
Jacob Steigleder, Shelburne Falls,	18 grapes.	

The following were collected by the Worcester County Horticultural Society.

O. B. Hadwen,	Worcester,	2 pears.	15 apples.
Isaac Mills,	"	3 "	9 "
Henry Phelps,	"	7 "	
William G. Maynard,	"	1 "	2 "
Mrs. G. A. Chamberlain,	"	2 "	6 "
Edward S. Howes,	"		4 "
Stephen Salisbury,	"	5 "	5 "
Alfred Davis,	"		2 "
William H. Earle,	"	6 "	
John C. Newton,	"	1 "	
Edward W. Lincoln,	"	2 "	
Mrs. Francis O. Eastman,	"		1 "

H. O. Western,	Worcester,	1 pears.	
Charles Nash,	"		1 apples.
Moses Church,	"	2 "	
F. M. Marble,	"	1 "	
W. T. Merrifield,	"	2 "	
Lorin Coes,	"	2 "	
Newell Wood, Millbury,		1 "	8 "
Joseph C. Lovell, West Boylston,		3 "	3 "
Mrs. Sarah D. Shaff, Leicester,			2 "

Permission was granted by the Society to add to this report the awards made by the Centennial Commission, when received. These awards are understood to consist of a medal, and a statement by the judges of the merits of the object exhibited, the latter being the essential part. Every effort has been made by the Committee to procure a copy of these statements, but without success. They can only say, therefore, that an award has been made to the Massachusetts Horticultural Society for a large collection of Apples and another for Pears; one to the Worcester County Horticultural Society, for Apples, and another for Pears; and awards to Messrs. Wilder, Hovey & Co., Fenno, Smith, Dickinson, Griffin & Dolan, Curtis, Clapp, Bates, R. Manning, Hadwen, Earle, Newton, and Lincoln, and Mrs. Chamberlain, for Pears; and to Messrs. Fenno, Smith, Cummings, J. W. Manning, and Hartwell, for Apples.

MARSHALL P. WILDER,
C. M. HOVEY,
BENJAMIN G. SMITH,
JOHN C. HOVEY,
ROBERT MANNING,
E. W. BUSWELL,
HERVEY DAVIS,
Committee.

MASSACHUSETTS HORTICULTURAL SOCIETY.

OFFICERS AND STANDING COMMITTEES FOR 1877.

President.

FRANCIS PARKMAN, of Boston.

Vice-Presidents.

CHARLES O. WHITMORE, of Boston.
WILLIAM GRAY, JR., of Boston.
H. WELD FULLER, of Boston.
C. H. B. BRECK, of Brighton.

Treasurer.

EDWIN W. BUSWELL, of Boston.

Secretary.

ROBERT MANNING, of Salem.

Recording Secretary.

ROBERT MANNING, of Salem.

Professor of Botany and Vegetable Physiology.

JOHN ROBINSON, of Salem.

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Shaw, S. P.,	Cambridge.	Taylor, Horace B.,	"
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Slack, Lewis,	Brookline.	Todd, John,	Hingham.
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Smith, George O.,	"	Turner, Royal W.,	Randolph.

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		Millar, John L.,	Boston.
Jameson, G. W.,	East Lexington.	Miller, David,	"
Johnson, H. A.,	Jamaica Plain.	Mills, William,	Somerville.
Jones, George H.,	Newton.	Minot, G. R.,	Boston.
Jones, Moses,	Brookline.	Minot, William, Jr.,	"
Jordan, Samuel,	Yarmouth.	Minton, P. J.,	Forest Hills.
		M'Intosh, A. S.,	Boston.
Kelsey, Fred W.,	Waverly, N. Y.	Morandi, Francis,	Malden.
Kendall, Jonas,	Framingham.	Morris, Thomas D.,	Boston.
Kennard, Chas. W.,	Boston.	Morrison, Hugh,	Gloucester.
Kennard, M. P.,	Brookline.	Morse, E. R.,	Somerville.
Kenrick, Miss A. C.,	Newton.	Morse, W. A.,	Boston.
Kingman, Abner,	Boston.	Morton, J. H.,	"
Lamprell, Simon,	Marblehead.	Murray, Daniel C.,	Brookline.

Muzzey, A. B.,	Cambridge.	Richards, John S.,	Brookline.
		Richardson, E. P.,	Lawrence.
Nichols, B. W.,	West Roxbury.	Richardson, Horace,	Framingham.
Nichols, J. R.,	Haverhill.	Roberts, Edward,	Hyde Park.
Northey, William,	Medford.	Rogers, John F.,	Cambridge.
Norton, P.,	Boston.	Russell, George,	Boston.
Noyes, George N.,	Auburndale.		
Nugent, James,	Boston.	Sargent, Wingate P.,	Melrose.
		Saunders, Miss M.T.,	Salem.
O'Brien, James,	Jamaica Plain.	Saville, George,	Quincy.
Odiorne, F. H.,	Malden.	Sawtell, J. M.,	Fitchburg.
Oldreive, Richard,	Newton.	Schlegel, Adam,	Boston.
Olney, Richard,	West Roxbury.	Scott, A. E.,	Lexington.
Owen, John,	Cambridge.	Scott, George H.,	Allston.
		Shattuck, F. R.,	Boston.
Paine, Benjamin F.,	Boston.	Shaughnessy, J. J.,	"
Palmer, Stevens G.,	"	Shedd, Abraham B.,	Lexington.
Parker, Charles E.,	Auburndale.	Shedd, Arthur B.,	"
Parker, Harvey D.,	Boston.	Shepherd, C. W.,	West Newton.
Parker, James M.,	Charlestown.	Shepherd, Edwin,	Lowell.
Parker, John,	Boston.	Sherman, Japhet,	Medford.
Parsons, William,	"	Simpson, Michael H.,	Saxonville.
Parsons, William B.,	Rockport.	Sleeper, J. S.,	Boston.
Patterson, James,	Cambridge.	Smallwood, Thomas,	Newton.
Payson, Samuel R.,	Boston.	Smith, Edmund,	Cambridge.
Perkins, S. C.,	Dorchester.	Snow, E. A.,	Melrose.
Pettingill, Thos. S.,	Brookline.	Southworth, Edward,	Quincy.
Philbrick, Edward S.,	Boston.	Spooner, W. H.,	West Roxbury.
Phillips, Nathaniel,	Dorchester.	Sprague, Charles J.,	Boston.
Phipps, Samuel, Jr.,	Boston.	Squire, J. P.,	Arlington.
Pillsbury, H. H.,	Medford.	Stanwood, E. How'd,	Grantville.
Plimpton, W. P.,	West Newton.	Starbird, Louis D.,	Malden.
Power, Charles J.,	S. Framingham.	Stearns, Charles,	Brookline.
Pratt, L. G..	West Newton.	Stone, Eliphalet,	Dedham.
Pratt, Samuel,	Chelsea.	Stone, Milton J.,	Brookline.
Preston, Jonathan,	Boston.	Stone, Samuel G.,	Charlestown.
Prince, F. O.,	Winchester.	Story, Miss Sarah W.,	Brighton.
Putnam, C. A.,	Salem.	Sullivan, J. L. D.,	Somerville.
Putnam, Francis,	"	Swan, C. W.,	Boston.
Putnam, H. W.,	"		
		Tailby, Joseph,	Wellesley.
Rand, George C.,	Newton Centre.	Tainter, A. E.,	Medford.
Randall, Macey,	Sharon.	Talbot, Josiah W.,	Norwood.
Ranlett, Charles A.,	Billerica.	Tallant, Miss C. L.,	Roxbury.
Ranlett, S. A.,	Melrose.	Tapper, Thomas,	Canton.
Ray, Edwin,	Boston.	Taylor, Moses,	Acton.
Rice, George W.,	"	Thatcher, L. P.,	Middleboro'.
Richards, Francis,	"	Thompson, G. M.,	Waltham.

Tobey, Miss M. B.,	Brookline.	Wellington, Jos. V.,	Cambridge.
Todd, Jacob,	Boston.	Wells, Benjamin T.,	Boston.
Torrey, Augustus,	Beverly.	Weston, Mrs. L. P.,	Danvers.
Tower, Elisha,	Lexington.	Wetherell, John G.,	Boston.
Trautman, Martin,	Boston.	Wheatland, Henry,	Salem.
Tucker, E. G.,	"	Wheeler, Miss Ann C.,	Cambridgeport.
Turner, N. W.,	Everett.	Wheildon, Wm. W.,	Concord.
		White, N. B.,	Norwood.
Underwood, Wm. J.,	Belmont.	White, T. C.,	Charlestown.
		Whitney, Joel,	Winchester.
Vandine, Henry,	Cambridgeport.	Williams, Dudley,	Jamaica Plain.
Van Voorhies, H. W.,	Everett.	Williams, H. W.,	Boston.
Vinton, Mrs. C. A.,	Boston.	Williams, Stephen,	"
		Wilmarth, H. D.,	Jamaica Plain.
Walker, Charles H.,	Chelsea.	Wilson, B. O.,	Watertown.
Walker, Joseph T.,	Boston.	Wilson, Geo. W.,	Malden.
Walker, Wm. P.,	Somerville.	Wiswall, Artemas,	Newton.
Wallis, M. L.,	West Roxbury.	Wiswall, Henry M.,	Watertown.
Wallis, William,	Boston.	Wolcott, Mrs. J. W.,	Boston.
Walsh, M. H.,	Brighton.	Wood, Mrs. Anna D.,	West Newton.
Waltham, George,	Nahant.	Wood, Miss C. S.,	"
Ward, Edward A.,	Cambridge.	Wood, Edmund M.,	Boston.
Warren, Samuel D.,	Waltham.	Wood, E. W.,	West Newton.
Washburn, E. F.,	Neponset.	Woodbury, Chas.,	Beverly.
Washburn, G. W. C.,	Boston.	Woodford, Jos. H.,	Newton.
Watson, B. M.,	Plymouth.		
Watson, David,	Malden.	Young, Thos., Jr.,	Somerville.
Webster, J. R.,	Boston.	Young, William,	Fall River.
Webster, John,	Salem.		
Wellington, Chas. A.,	E. Lexington.	Zirngiebel, D.,	Needham.

EXTRACTS FROM THE BY-LAWS.

SECTION XXVI.—Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments; and any member, having once paid an admission fee, may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVII.—Admission Fee and Annual Assessment.

Every subscription member, before he receives his Diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an

admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIX.—DISCONTINUANCE OF MEMBERSHIP.

Any member who shall neglect for the space of two years to pay his annual assessment shall cease to be a member of the Society; and the Treasurer shall erase his name from the List of Members.

The attention of Annual Members is particularly called to Section XXIX.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1877.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1877.

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Massachusetts Horticultural Society,

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The Committee on Publication and Discussion take this opportunity to repeat what they have heretofore stated, that the Society is not to be held responsible for the certainty of the statements or the correctness of the opinions expressed in the papers and discussions now or before published, but undertakes only to present these papers and discussions, or the substance of them, correctly. The award of a prize for an Essay is not to be understood as implying that the Committee approve it in every particular, but only that they believe it calculated, *on the whole*, to promote the science or art of Horticulture.

WILLIAM C. STRONG, *Chairman.*

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 6, 1877.

A duly notified stated meeting was holden at 11 o'clock, President PARKMAN in the chair.

The President read the following address.

ADDRESS OF PRESIDENT PARKMAN.

During the last year the working of the body of laws, adopted in the year that preceded, has been put to the test. The result has been all that could be wished. The new order of things seems to have given universal satisfaction. The advantages of the most important change, that affecting the powers and functions of the Executive Committee, are beginning, at length, to be recognized. This Committee, composed, in part, of persons in whom the Society has placed its highest confidence, and on whom it has conferred its highest offices; and in part of persons chosen by it for this special purpose, and subject to removal by its annual vote, supplies a want which has long been felt. The duty of the Committee is not only to watch over the interests of the Society, and make such suggestions as its welfare may seem to require, but also to receive the complaints of members, consider all causes of dissatisfaction which may be brought before it, and take such action as may best promote general harmony and good feeling. It provides members with a source of relief from grievances which hitherto have had no means of redress.

Another important change embodied in the new By-Laws is that which opens the prizes of the Society to general competition. The result of this provision has been precisely what was expected by its originators. No perceptible change has taken place in the distribution of prizes. Now, as heretofore, they are won by our own members; and they will continue to be so; for with us the admission to membership is so easy, and its burdens so light, that those who have the inclination to compete for our prizes will soon seek to enroll themselves among us. At the same time, the stigma of illiberality, which a Society endowed like ours can ill afford to bear, has been completely removed.

During the ten years past we have made a growth as rapid as it is healthy, and we still continue to make it. The discussions on horticultural subjects, which are one of its most marked indications, have never been better attended, or more interesting than during the last winter and spring, and their value has been widely recognized in this and in other countries. A conspicuous improvement has taken place in our winter exhibitions, which a few years ago could hardly be said to exist. Displays were made last winter so admirable that they might almost dispute the palm with those of summer; and they had the advantage of being accessible to a class of persons who are apt to be absent from town during the usual exhibition season. The summer displays, in spite of the heat and drought, were fully equal to those of former years; and at some points they were superior. The show of specimen roses, in particular, was never before so fine; and the show of fruit was, in some departments, unusually good.

In the autumn of 1875, an experiment was tried with results so unsatisfactory that it was not thought expedient to repeat it. All our members, with their families, were invited to join in a dinner, the cost of which was borne mainly by the Society, the guests contributing but a fraction. To make it wholly free to so many persons would have involved an unsupportable expense; so few, however, applied for the tickets that a failure would have taken place had not a considerable number been purchased and distributed gratuitously by a few individual members. In view of this imperfect success, the annual entertainment of last autumn was restricted to the usual simple dinner to those who had given time and labor to the official work of the year.

Our general prosperity is not without one shadow. The report

of the Treasurer will show a deficit, arising partly from the general depression of business, causing a serious reduction in the rents of our halls, and partly from the entire failure of the dividend from Mount Auburn, which was once the main source of our income. Such failure has never happened before, and let us hope that it will not happen again. The reduction of our income is not relatively greater than that of many other institutions, and it is far less than that of some. Meanwhile, we can comfort ourselves with the assurance that we are in a condition to bear it better than any other horticultural society in America, if we but recognize the inevitable fact, and adapt ourselves to it by careful husbanding of the resources which remain.

The following appropriations, recommended by the Executive Committee, were voted:

For Prizes for Plants and Flowers,	$3,000
" " " Fruits,	1,900
" " " Vegetables,	1,000
" " " Gardens,	200
	$6,100
For Testimonial to Edward S. Rand, Jr., Ex-Recording Secretary, agreeably to the report of the Special Committee on that subject,	100
For the Library Committee, for the purchase of magazines and newspapers, binding of books, and incidental expenses of the Committee,	300
For the Committee on Publication and Discussion,	250

E. W. Buswell read his Annual Report as Treasurer, including the Report of the Finance Committee, which was accepted and referred to the Committee on Publication.

William C. Strong, Chairman of the Committee on Publication and Discussion, read the Annual Report of that Committee, which was accepted and referred back to the Committee. Messrs. Strong and Muzzey, of the Committee, also announced the arrangements for the Meetings for Discussion, during the winter, including lectures by Prof. George L. Goodale, of Harvard University, who kindly volunteered his services, and several other scientific gentlemen.

Robert Manning read his Annual Report as Secretary, which was accepted and referred to the Committee on Publication.

On motion of E. S. Rand, Jr., it was voted to postpone the consideration of the offers of Prospective Prizes for one week.

W. C. Strong, Chairman of the Committee on Publication and Discussion, announced that a meeting would be held on the next Saturday, at 12 o'clock, when it was expected that a Prize Essay on the Culture of the Melon and Squash would be read.

Adjourned to Saturday, January 13.

BUSINESS MEETING.

SATURDAY, January 13, 1877.

An adjourned meeting of the Society was holden at 11 o'clock. The President and Vice-Presidents being absent, William C. Strong was chosen President *pro tem.*

Mr. Strong, as Chairman of the Committee appointed April 1, 1876, to take into consideration the recommendations concerning the Society's Herbarium, in the paper read by the Professor of Botany, reported that while the Committee appreciated the remarks of the gentlemen who spoke in favor of these recommendations, they were of the opinion that in the present financial condition of the Society it was inexpedient to take any action, and asked to be discharged. The report was accepted, and the Committee was discharged.

It was then voted to take up the matter of Prospective Prizes, and after a full discussion by C. M. Hovey, J. B. Moore, E. S. Rand, Jr., W. C. Strong, N. B. White, William Gray, Jr., M. H. Merriam, R. Manning, and F. W. Kelsey, the following votes were passed:

Voted, That it is the sense of the Society that in the offer of Prospective Prizes, the words "a public trial of three [or five] years" should be changed to "a trial satisfactory to the several committees."

Voted, That as the Schedule of Prizes for 1877 is already published, this construction shall be applied to the present year.

Voted, That the respective committees be instructed to recommend all awards of Prospective Prizes to the Society, for approval, on the first Saturday in December, of each year, and that all such

awards shall be made by the several committees subject to such approval.

Adjourned to the first Saturday in February.

MEETING FOR DISCUSSION.

The Chairman introduced J. W. Pierce, of West Millbury, Mass., who read the following Essay, for which a prize had been awarded by the Committee on Discussion:

SQUASH AND MELON CULTURE.

BY J. W. PIERCE.

SQUASHES.

The squash is one of the most important of our garden vegetables. It has been greatly improved within a few years, and is rapidly gaining in public favor. In old times the common pumpkin was used where squashes are now. Then not only pies were made of pumpkins, but they were boiled and served for the table; but how they must have tasted compared with the Hubbard or Butman squash of to-day! I do not know of any plant which will produce so much good, wholesome food for man or beast from an acre of land as the squash, unless we except the cabbage, and by the American people the former is deemed vastly superior for the table.

The origin and early history of the squash seem to be shrouded in mystery, mainly owing to the readiness with which the different varieties intermix with each other and with the pumpkin. Indeed the distinction between a squash and a pumpkin is very indefinite; we all know a squash from a pumpkin, yet it is difficult to define the difference, and really there is more difference in flavor and looks between different varieties of squashes than between some kinds of squashes and some kinds of pumpkins. The squash belongs to the same family with the pumpkin, watermelon, cucumber, and musk-melon. These are all annual plants of the natural order, *Cucurbitaceæ*, or Gourd family, which is of a tropical or subtropical origin.

Different varieties of squashes and pumpkins seem to come from different countries, yet, with a few exceptions of recent introduction, we know very little about their origin. Prof. Asa Gray, says: "The pumpkin was cultivated by the North American Indians, before the coming of the whites." He also says: "The orange and egg gourd grows wild in Texas, and is probably the original of all this group."

It seems to me that the pumpkin might have originated from the gourd, and the squash from the pumpkin. The fact that the gourd is more vigorous and productive than the pumpkin, and that the pumpkin is more vigorous than the squash, seems to indicate this order of improvement. It is a well established fact that the farther from the original an animal or plant is carried by domestication and improvement, the less vigor it has, and certainly our best squashes have less constitution and vigor than the pumpkin, and the pumpkin less than the wild gourd.

Selecting the Soil. The first step in order to raise a paying crop of squashes, is to select a soil suited to the crop, for without the right soil it is useless to waste time, seed, and manure. The squash requires a rich, warm soil, — such a soil as will produce seventy-five bushels of corn per acre. It should be a strong loam, without too much sand, or too heavy with clay, yet it would be better to be quite light than heavy and cold. As a general rule squashes grown on light, warm land are not so large, but are more solid, keep better, and are of better flavor than those grown on low or cold land. A side-hill with a southern aspect is preferable, especially when one's land is late and cold. It is useless to attempt to grow squashes on cold or wet land, for, like corn, they are very sensitive to cold, and will not grow in the shade, or where the land is saturated with water. Squashes may be grown either on inverted sods, or on old tillage land, but I prefer the sod land, because it is freer from weeds and bugs than old land.

Preparing the Soil. Having selected a suitable soil, how shall we prepare it for planting? If old tillage land, I would plough it in the fall, and again in the spring plough and harrow just before planting; but if green sward is to be planted, plough and harrow late in May, as near planting time as possible, so as to avoid the weeds, which will start before the squashes, if the land lies unworked long before planting. Then again by ploughing grass just before planting, we turn under a light crop of green grass which

will help to rot the sod and make the soil light and porous; this I consider very desirable, because the squash vine must have warmth and air in order to thrive.

Manure and its Application. The squash is a gross feeder, and delights in an abundance of nitrogenous manure. All kinds of manure seem to agree with it excepting kelp, salt fish, and other manures containing salt. The squash is very rich in nitrogenous substances and consequently requires nitrogenous manures, while it does not need so much phosphoric acid as the cereals. I have found hen manure the best fertilizer I could apply to squashes. It is very heating and is rich in nitrogen. I find by experiment that home-made superphosphate will grow better corn than hen manure, while the hen manure, will grow double the amount of squashes that the superphosphate will. As a general rule, the more manure we apply to squashes, the larger crop we obtain. I have never found a limit to the profitable application of manure to squashes; of course there is such a limit, but it is very seldom reached. The more manure we apply the surer we are of a crop in spite of a possible drought, for well-manured squashes will flourish, while others, growing on a short allowance of this indispensable article, will wilt and dry up; indeed, we need not fear the drought, with good land, plenty of manure, and thorough cultivation. The past season I applied eight cords of green manure from under the cow stable, spread on, and a shovelful of dry hen manure in each hill; and I would recommend more rather than less. Great care must be taken in covering the manure in the hill, as hen manure, or other strong nitrogenous manures will destroy the seed if they come in contact with it. It will not be safe to rely on kicking the dirt over the manure with the foot, but a very much better way is to have a man go ahead with a hoe, to press the manure down and cover it with an inch of fine earth. Guano, night-soil, or well rotted stable manure may be used with good success. If stable manure is used, I would apply not less than three or four shovelfuls in each hill. We must have manure enough to warm the soil and give the plants a good start, so as to drive them ahead of the bugs. The roots of a squash vine run very close to the surface, and consequently we should apply the manure at the surface and work it in very lightly. It is also best to apply part broadcast and a part in the hill, for that in the hill will give the plants an early start, driving them ahead of the bugs, while that applied broadcast will help to sustain

the vines after the roots have got beyond the hill, and will also be found by the little roots which grow from each joint after the vine begins to run.

When shall we Plant? This depends on the season; but a safe rule will be to plant as soon as cherry trees begin to blossom. The squash needs the whole season of warm weather to perfect itself, and should be planted as soon as the ground is warm and dry. It is better to plant too early than too late, for when planted too early, we only lose the seed, and can plant over again. In ordinary seasons the fifteenth of May is none too early.

Planting the Seed. Having ploughed the land, and worked a good dressing of manure into the surface soil, the rows should be marked out seven or eight feet apart each way, and a slight hole, large enough to hold the manure below the surface, should be made. I find seven feet about the right distance apart, and better than a greater distance, as missing hills will be covered by the vines from other hills, making a more even field. Press the manure down level and cover it with an inch of fine earth, and drop six or seven seeds in each hill, taking care to spread them evenly over the hill, and cover, if the soil is moist, only one inch deep, but if dry, one and a half inches is better. I do not like to press the soil over the seed unless it is very dry or sandy, for pressing moist soil makes it cake, and obstructs the tender plant in coming up.

Thinning out the Plants in the Hills. As soon as the plants get a good vigorous start, with five or six leaves on them, they should be thinned to three or four in a hill, depending somewhat on the number in the surrounding hills. Where there are missing hills those around may be left thicker so as to cover the vacancy. I know I am recommending very much thicker planting than most writers on squash culture, but I am convinced it is best to leave a good stand of plants, making some allowance for loss by insect enemies. I also fail to see the disadvantage of too thick planting, as some do. I like to have the ground covered so as not to give the weeds a chance, and so that the leaves may be some protection to the fruit against an early frost, which may take us by surprise. When I began to raise squashes I thinned a good deal closer than I do now, and the bugs thinned closer still, which made the crop quite light sometimes. It is better to have too many vines than not enough.

Hoeing and after Cultivation. As soon as the plants appear

above ground, they should be cultivated out, and the soil loosened around them with a hoe. After this, keep the cultivator and hoe going often, so as to keep the soil light and the weeds down. It is very important to hoe and cultivate often at first, so as to get the land clean before the vines begin to run. Then they should be cultivated and hoed for the last time, drawing the soil around the roots in a broad, flat hill, but not very high. I like to have the vines covered for a little distance, as I think it makes them stronger, and is something of a protection from the borers. It will be found better for the crop, to keep out of the field after the vines cross the rows, even if the weeds do grow, for moving the vines will be of more injury than the weeds. It is better to get the land so clean before the vines run that the squashes will keep ahead of the weeds.

How to Protect Squashes from their Enemies. The greatest difficulty in raising squashes is to protect them from the insect enemies, which continually attack them, from the time the leaves appear above ground until the fruit is ripe. But they can be protected by constant care and attention, and no one who is not willing to give them this, should attempt to raise squashes. By this I do not mean that they need to have a great amount of labor performed on them daily, but that they should be watched closely, to see if they are doing well. As soon as the leaves are seen above ground, they should be watched for the appearance of the striped bug; and as soon as he is found, the plants should be dusted over with plaster in the morning when the dew is on, or immediately after a rain, while they are yet wet, so that the plaster will stick to the leaves. This should be repeated every few days and after every rain, which will wash it off, until the bugs leave, or the vines are too large for them to injure. The most expeditious way to do this is to go through the field with a pail of plaster and a hand sieve or dredging box, such as we kill potato beetles with, and shake the plaster over the vines. It will take but little if applied in this way. Ashes, air-slacked lime, or fine earth, will answer, but are not so good as plaster. I have also tried sulphur, but cannot recommend it, as it seems to poison the vines. About the time the third or fourth leaf is out, the black bug will appear, usually in pairs—two, four, six, or more on a hill. They are found around the stalk at the surface of the ground, and often cut it off in a few days. These are the old bugs which have survived the winter, in a dormant state, hidden

away under old rubbish, in stone heaps and similar places. This is the most critical time in the growth of the squash, and if it is neglected now so as to allow these bugs to lay their eggs for a new crop of bugs, we may as well give up the squash patch at once, for it will be impossible to raise a good crop of squashes if the vines are covered with black bugs. The only successful warfare we can wage against them is to kill these old bugs before they lay their eggs. This can be expeditiously done by placing a shingle on the ground close to the vines of each hill, although every other hill will be enough usually, as they will leave the hills which have no shingle for those that have. Having placed the shingles, go round every morning with a pail, and brush the bugs, which are on the under side of the shingle, into the pail, and scald or burn them. If faithfully applied, this will be a sure cure for the black bug scourge, but it must be followed up closely, until the vines run, or enough will escape to perpetuate the race and destroy the crop of squashes.

Wilting Squash Vines. The question is often asked, "What makes my squash vines wilt and die when nearly grown?" This may be the result of a variety of causes; often a borer which is eating out the inside of the stem. Of these borers there are said to be two or more kinds. They are hatched from eggs laid by an insect on the vine near the root. When the borer is at work his presence may be detected by his excrements, which will be seen at his place of entrance near the root, or at a joint. The vine may be split open and the borers removed, and if well covered with moist earth may sometimes be restored. Mr. Warner, of Sunderland, reported at one of the meetings of the State Board of Agriculture that he was successful in destroying the borer by the application of tobacco to the roots of the vine. In my experience with squashes I have never been able to find a borer, but have, in a few instances, found maggots eating up the roots of wilting vines. Not being able to find the borer, I have been led to look for other causes, and have come to the conclusion that the black bug is oftener the cause of the mischief than most people are aware of. By following these wilting vines to their source, a few black bugs will often be found on the under side of the leaves, near the roots. Sometimes no bugs will be found, but a few dry leaves will tell that they have been doing the mischief but have left. I believe these black bugs are the cause of four-fifths of all the wilting of squash vines. The black bug seems to be very poisonous to the squash. They often attack

a nearly mature squash and it soon wilts and rots, and the presence of a few on the leaves of a vine near the root seems to poison the entire vine and often causes its death. Several years ago I lost an acre of squashes in this way, after the fruit was set, and some of it nearly grown. It all rotted and was an entire failure. When the vines are wilting from this cause, I think the best remedy is, to go into the field, hunt them up, and destroy them. This may be done by making a pair of paddles of shingles and squeezing the bugs between them, care being taken not to injure the vines.

Woodchucks are often very destructive to squashes. Killing them with dog, gun, and traps seems to be the only remedy. Smoking them out with brimstone and putting poisoned apples into their holes have been recommended, but I have never tried these methods.

Harvesting and Marketing the Crop. The ripening of a squash, if of a soft stemmed variety, is indicated by the shrivelling and drying up of the stem where it joins the squash. As a squash ripens, its upper surface assumes a deeper color; the green colored ones turn brownish on top, and the yellow kinds turn to a dark yellow or orange color; the hard shell kinds harden. As fast as they ripen it is best to gather and market, if there is a fair demand for them with remunerative prices, as they seldom pay for the care, extra labor, and loss by decay, when stored. The earlier they are sold, the better price they will usually bring, unless kept until midwinter. The weather should be closely watched so as to anticipate the first frost in season to gather the remainder of the crops into heaps, or into a shed where they may be protected from frost. When first gathered avoid piling them on top of each other as much as possible, as they are apt to rot where they touch, when piled before they are ripe, but let them lie spread out where they will dry and ripen, out of danger of frost.

Keeping Winter Squashes. Keeping squashes in winter seems to be attended with considerable difficulty. They cannot be kept where it is damp, as in most cellars, or where frost can reach them, nor will they keep so well where it is very warm. The best conditions for keeping them seem to be where the air is cool and dry, yet safe from frost. An attic chamber until winter; then a closet near the chimney where the frost cannot reach, or the temperature does not rise very high, is the best most families can command. Extensive market gardeners often keep them in houses built for the

purpose, where they can maintain an even temperature by the aid of fires and ventilation.

Saving the Seed. Great care should be taken to save seed only from perfect specimens, which are up to the standard requirements of their kind, and as much superior as possible. When two or more kinds are planted near together the seed should not be saved, as the product will be only mongrels, owing to the readiness with which they mix. But it is better to plant each variety by itself; and to save our own seed, for the squash can be wonderfully improved by good cultivation and careful selection of seed. I do not believe in changing seed, for the sake of a change. I have some varieties of squashes, the seed of which I would not exchange with any one, and I take great care to keep them pure. The seed of a squash should not be saved unless the quality and flavor prove satisfactory at the table. When thoroughly dry, the seed should be carefully marked with the name of the variety and the year. The special characteristics of the specimen, if it has any, should also be marked, as extra dry, extra sweet, or very large.

The Future Improvement of the Squash. Although the squash has been wonderfully improved of late years, I do not think it has reached perfection. Indeed, I believe it may be improved more in the future than it has been in the past. The wonderful success of Mr. Butman in hybridizing, by which he produced the variety which bears his name, is an encouraging sign of future improvement. Yet good as his new squash is, I do not consider it perfect. I believe a squash may be produced as sweet and dry as a sweet potato, with as hard a shell as the Hubbard or the Butman, with as delicate a color as the Butman when served for the table, and as thick meated and productive as the American Turban. Certainly we have no such squash now. Who will be the one to produce it, and thereby immortalize his name?

Feeding Squashes to Stock. The squash is very rich in flesh and fat-forming elements, consequently it is a valuable food for stock, and all the waste of the crop should be carefully saved and fed. The specked and green ones, boiled up and mixed with meal and shorts, make excellent food for swine and poultry, and cut up raw they are valuable for cows and young stock. When feeding them to hens, and cows giving milk, the seeds should be removed, as they have a diuretic effect, which tends to dry up the milk, and cause hens to cease laying. I think squashes are worth half as much a ton to feed as good hay.

Varieties.

I. Summer Squashes.

Summer Crookneck. This is very early, productive, and of fine flavor, and is the standard for an early kind.

Yellow, and *White Bush Scalloped.* These two varieties are alike, excepting in color, and are early, scallop-shaped varieties. They are extensively cultivated at the south, for shipping north. In New England they are not as popular as the Summer Crookneck.

II. Fall and Early Winter Squashes.

The *American Turban* stands at the head of this class. It is the largest and most productive squash I know, excepting the mammoth varieties, which I do not consider much better than the pumpkin. Some specimens are as sweet and dry as the Hubbard, and the flesh is usually finer grained and of a better color, being of a bright orange, and free from green streaks. It is not as uniform in quality as some kinds, some specimens being light colored, insipid and watery, but when you get a good one you have a superior table squash.

They are a soft-skinned variety, of yellow color, in form somewhat like a peck measure, with a peculiar acorn-shaped mark at the calyx. In some specimens this acorn is quite prominent, standing out boldly from the squash. In selecting seed of this variety, I have always discarded those in which the acorn stood out very much, yet I would have the mark quite distinct, but not very prominent.

Cocoa-nut Squash. This is an excellent little squash. It is very prolific and grows somewhat in clusters, but the fruit is so small — about the size of a cocoa-nut — that the weight of the crop is quite light. It is the handsomest of all the squashes, being spotted all over—one end bright yellow and orange, the other dark and light green, the division between green and yellow being even and straight around the squash, giving it the appearance of parts of two different colored squashes joined together. The flesh is fine grained, sweet, and very dry, and of excellent flavor. It is too small for general cultivation, but for small families, which cannot use the whole of a large squash at once, it is more desirable than if it were larger.

Boston Marrow. This is a very popular fall squash, of a bright orange color, and is probably more extensively raised by market gardeners than any other variety. I do not like it, and do not consider it worthy of cultivation as compared with the Turban.

III. WINTER SQUASHES.

Hubbard. This is the standard winter squash. Pure, well-ripened specimens are of a brownish green color, with a shell of flinty hardness. The flesh is very sweet and dry. It is an excellent keeper, and is too well known to need any extended description.

Butman. This is a new squash introduced by Mr. Gregory, in 1875. It is a hybrid, originated by Mr. Butman, of Maine, and was produced by crossing the Hubbard with the Yokohama, and certainly is an acquisition. I consider it the best winter squash yet produced. The Hubbard is the standard at the present time; but there are some points in the Butman which I think are an improvement on the Hubbard. It is sweeter and finer grained; handsomer and more attractive. The outside is of a beautiful green with white spots, and the flesh is a sort of lemon color; being lighter and more delicate than the Hubbard, or most of the popular sorts, and entirely free from those green streaks which are found in the flesh of the Hubbard, next to the shell, and which injure its appearance when served for the table. The shell is as hard as the hardest Hubbard, and when quite ripe is often somewhat warty. It seems to be a little later than the Hubbard; the vines remaining green after the other kinds are dead. They do not grow quite so large as the Hubbard, but they set more thickly on the vines, and will probably produce as much weight per acre. My largest specimens this year weighed ten pounds, with the same cultivation as produced specimens of the Hubbard weighing eighteen pounds. The Butman may be called a *pure bred* squash, being remarkably uniform in color and quality, proving it to be a variety of established purity, which it is difficult to obtain in the squash family, and which, when attained, requires great care to preserve.

Marblehead. This is a new squash, introduced a few years since by Mr. Gregory. When ripe it is covered with a hard shell similar to the Hubbard, but of a bluish green color. It grows a little larger than the Hubbard, and the flesh is brighter colored and freer from green streaks, with a flavor very much the same. I have tried

it but do not like it, and have abandoned its cultivation. It is too late, and has too many seeds and too little flesh, being almost as seedy as a pumpkin.

Yokohama. This is a variety from Japan; it is flattish in shape, deeply ribbed, and greenish colored, turning yellow when quite ripe. It is recommended as a good squash but I have never tried it.

Winter Crookneck. This is an old fashioned squash; it is excellent for pies, one of the best of keepers, and still has its friends; but I do not consider it as worthy of general cultivation.

Melons.

The cultivation of melons is very much the same as that of squashes. Yet there are some points of difference which should be briefly noticed.

Melons require a warmer and lighter soil than squashes. They will grow on poorer land if it is only early and warm. The manure should be mostly applied in the hill, and of a more heating nature than for squashes, while they will not require so much spread on. All green, coarse manure should be avoided, as it will produce too much vine and delay the setting of the fruit too long. Use hen manure, guano, animal fertilizer, or composted night soil and stable manure. They should be planted nearer together than squashes—five feet apart being about right. They will not bear so deep planting as squashes—from three-quarters of an inch to an inch and a half is deep enough. Plant ten or twelve seeds in each hill, and thin to half that number. Watermelon seeds should be soaked in warm water two days before planting, to hasten germination, as they are very slow about coming up.

When one's soil is cold, melons may sometimes be raised by filling a large hole with compost, and covering it with soil, in which half its bulk of sand is mixed. A little sand used this way will help them very much. Frequent cultivation and hoeing is very essential, in order to hasten their growth.

When Should the Fruit be Gathered? This is a very important matter, for a green melon is worthless, and they will spoil very soon after they are ripe. The ripening of muskmelons may be readily detected by the change of color, and by the separation of the stem from the fruit, if ripe; but if green it will hold quite strongly, and finally break if forced. It is more difficult to tell when a watermelon is ripe, but an experienced grower will readily detect the ripe

ones by the sound they give when rapped upon. Green watermelons sound hard and solid, while a ripe one has a dull, hollow sound, but this is one of the things that must be learned by practice.

The varieties of melons are almost endless, but the following are a few of the most popular sorts.

Muskmelons.

Casaba. A very large, deeply ribbed and oblong shaped melon. The flesh is greenish colored, very sweet, and of superior flavor. It is the best muskmelon I have ever raised. I consider it worthy of general cultivation.

Ward's Nectar. This is a small round melon. It is very sweet and of delicious flavor.

Yellow Cantaloupe. A medium sized, round melon. The outside is yellow and slightly ribbed, while the flesh is salmon colored and has more of the peculiar musk flavor than most kinds. It is quite early.

Green Citron. This is a round melon, deeply netted with green; flesh of rich, delicious flavor.

Sill's Hybrid is a very early and sweet melon; flesh salmon colored and of excellent flavor.

Watermelons.

Phinney's. This is an oblong shaped melon; the outside is spotted, but quite dark colored. It is very solid, and the seeds are white excepting at the eye. The flesh is bright red, very sweet and juicy, with a very thin rind. It is very productive and worthy of general cultivation.

Mountain Sweet is an old standard sort. It is long shaped, dark green, with dark seeds. The flesh is sweet, solid, and delicious.

Mountain Sprout is a large, long, striped variety, with drab colored seeds. It is very productive and sweet.

Black Spanish. This is a dark green, small, round melon, very sugary; it is recommended for private gardens.

Sculptured Seeded Watermelon. A new variety from Japan. It is round, dark green, and of medium size. The flesh is cream colored and very sweet. The seeds are dark colored, with singular marks on them, resembling Oriental characters.

Discussion.

O. B. Hadwen said that he had been much interested in the description of new varieties. He agreed with the essayist in regard to the depredations of insects, but he would pinch off the heads of the black bugs instead of collecting the bugs in a pail.

Mr. Pierce said that the bugs would not crawl out of the pail. It was thought by some that the odor caused by crushing them in the field would attract more bugs; for this reason he preferred to carry them off the field and scald or burn them. He did not doubt the existence of the borer, though he had never been able to find one himself. He had never tested the Butman squash before the last year, and, although his Hubbards were rotting some, he had found no specked Butmans.

Mr. Hadwen said that the black bug lays its eggs in clusters on the under side of the leaf, where they hatch in a few weeks. Before being hatched they may easily be destroyed by pinching them, thus diminishing the number of insects the following season and preventing injury to the squashes in the autumn. This bug often punctures the vines near the surface of the ground, thereby destroying them. The borer has never given much trouble in Worcester county.

E. W. Buswell said his experience had been that the black bug injured the foliage.

John B. Moore thought that there would be but little difficulty in raising squashes, if we could get rid of the insects. Among other insects which infest them is the blue louse, which is found on the roots sucking out the juices. He had seen a short, white grub in the vine.

George Hill said that different locations would require different treatment. He was doubtful whether the black bug did as much injury as it is reported to do. He had seen a whole field cut down by the borer. Some years, with the utmost pains, you cannot get a good crop of squashes. He manures broadcast, but more heavily in the places where the hills are to be. The roots will run twice the length of the vines; they are gross feeders, and will be sure to find the manure.

He found it difficult to keep the varieties pure. He could select seed of the Mountain Sprout watermelon so as to bring it to the Black Spanish, and *vice versa*. He had selected the seed of a green flesh melon, originally from New York, so as to bring it a fortnight earlier, but while doing this the quality deteriorated. The musk-

melon also can be grown in any direction; he had got one up to thirty-seven and a half pounds, and three weighed a hundred pounds. These did not deteriorate. The case is the same with all vegetables, and Mr. Hill thought that sufficient attention was not paid to the selection of seed.

Mr. Pierce said that the method of manuring recommended by him was adopted because his soil required heat. He did not mean to say there was any connection between the borer and the black bug, but only to say that they both produce the same effect. He had noticed hills wilting when there were no bugs to be seen on them, but he usually found dry leaves near the root, which indicated that they had been there. He thought half a dozen black bugs would make a vine that had run ten feet, wilt. He never found a vine that had been attacked by black bugs that did not wilt in a hot sun.

J. S. Richards had found, in every instance where vines wilted, some trouble at the root—either blue lice, or rust, or some other cause of injury to the health of the plant. The cause might be in the manure.

E. W. Buswell suggested that a vine growing in a manure heap often produced more squashes than half a dozen vines in the field, so that the injury could hardly be from the manure. Perhaps the vines were attacked by microscopic insects.

Mr. Richards did not believe that you could give a squash too much manure, if of the right kind; but thought the plants might be injured by unsuitable manure. Maggots might do mischief, but he had always found the root diseased.

Mr. Pierce had found small white maggots at the roots of vines. A vigorous vine might survive the attacks of the black bug for some time.

Mr. Hill said that of late years he had paid no attention to the black bug, but that he did make a business of examining his vines for borers two or three times a week. He found them by cutting, and had sometimes traced them for a foot. He put dry earth over the wounds, and if a quarter of the stem was left the vine would grow and heal; if covered with wet earth it would rot. He had had fields where the borers were as plenty as ever were seen, and no vines wilted. If the black bug was not poisonous to the vine, he did not think the sap drawn out by them would injure it. He had seen young vines attacked by the black bug, which continued to grow vigorously and ripen fruit.

Mr. Moore thought it best to spread the manure, if you manure highly. The plants send down roots at every joint, and when the main root was destroyed these roots would often enable the plant to carry a full crop. This was an argument for spreading the manure broadcast.

Mr. Pierce said that he spread part, as recommended in the essay—eight cords to the acre—and used a shovelful of dry hen manure in the hill.

Mr. Hill would not apply hen manure without composting. He thought a shovelful of clear hen dung in a hill would destroy the seed.

Mr. Pierce said that last year he applied a shovelful in the hill with good effect. He was careful to cover with an inch or more of soil, making a hill a foot and a half broad.

MEETING FOR DISCUSSION.

SATURDAY, January 20, 1877.

William C. Strong, Chairman of the Committee on Publication and Discussion, presided, and introduced George L. Goodale, Assistant Professor of Vegetable Physiology in Harvard University, who delivered a lecture, of which the substance is here given, on

FERTILIZATION AND CROSS-FERTILIZATION.

Professor Goodale commenced by describing the structure of a flower, which he illustrated with a large model of a pink, showing first the axis; next the bracts or modified leaves surrounding the lower part of the calyx, but affording no great degree of protection; then the protecting organs—first the calyx or cup—the word calyx being derived from a Greek word signifying "cup;" and second, the corolla—the name of which is of Latin derivation, signifying "crown" or "garland." All these and other organs of the flower are modifications of leaves. For the recognition of this principle we are indebted not to a professional botanist but to the poet Goethe. It gave us a clue through all possible labyrinths of form, and led to the study of morphology—the science of form—which has been called the soul of natural history.

Within the enveloping organs we come upon an entirely different set of modified leaves—the stamens, each consisting of a stalk or thread, having at the summit the essential part, a case or anther containing pollen. This pollen can escape in several ways; in the flower under consideration it escapes by a little slit in the anther. The form of the pollen grains is generally spheroidal; in the cucumber the pollen grains are nearly spherical, and covered with protuberances. In the evening primrose the pollen grains are of irregular form. These various forms were illustrated by the lecturer on the blackboard.

Owing to their minuteness we have no means of mechanically dividing these grains for examination by the microscope, and they must be broken up by chemical means. We then find that they contain a tiny mass of protoplasm, with a little food consisting of starch and oil.

Next we come to a pod containing immature seeds or ovules. The ovule of a lily was sketched on the blackboard, and shown to consist of a central nucleus surrounded by integuments. One of the cells of this nucleus is larger than the others, and only partly filled with a substance shown to be protoplasm, similar to that in the pollen grain. Here we have two reciprocals; by their interaction is produced a fertilized germ, capable of growth. The lecturer here remarked that he should confine himself to established facts, and not enter upon any debateable ground.

When a grain of pollen becomes attached to the stigma, or upper part of the pistil, and begins to grow, a very curious phenomenon is observed. This was illustrated by a sketch of the pistil of the shepherd's purse, which has a sticky surface at the upper part, and a row of ovules in the ovary below. The pollen grain receives the moisture of the pistil and sends down a tube, or long cell. At first this grows at the expense of the food stored up in the pollen grain itself; but afterwards, like an invading army, which lives upon the country conquered by it, it receives food as it goes along. The tube extends with greater or less rapidity, and the tip of this long cell passes through the aperture in the ovule, and the contents of the pollen grain are blended with the embryo. Up to this point there is no change in the ovule, and in some plants, such as a few orchids and certain species of the heath family, like *Monotropa*, it is left in a rudimentary condition. But in a vast majority of instances there is a great change; in the shepherd's purse and buck-

wheat, there is a line or partition formed through the protoplasm; cell multiplication takes place; the whole enlarges and constitutes a germ. The two kinds of protoplasm have contributed to the formation of an entirely new individual, and we have a seed—an embryo plant with a supply of food, the whole protected by integuments. The lecturer remarked that the old analogies between plants and animals in regard to fertilization can now be all thrown aside, while between the fertilization of the higher and lower plants there exist not only analogies but homologies, in an almost unbroken, though not a straight line.

After a recapitulation of the essential parts of the flower, and the remark that the outer parts were not merely protective, but often exercised the function of attracting insects, the lecturer proceeded to the second part of his subject, viz., the means whereby cross-fertilization is secured. This is one of the most fascinating parts of vegetable physiology. In the latter part of the last century a book was written by Conrad Sprengel, on the intervention of insects in fertilizing flowers. Sprengel read the puzzle rightly, concluding that in the greater number of cases there is some provision, by insect or other agency, to prevent self-fertilization; but at that time botanists were studying plants in their relations to each other, and classifying them by means of dried specimens; and his researches in regard to living plants were overlooked. Early in the present century the object of this provision was discovered by Thomas Andrew Knight, the eminent English horticulturist and physiologist, to be the keeping down of all vagaries, and the prevention of deviations from the parent type. Attention was called to this subject again in 1858 and 1862, by Charles Darwin, who was convinced that occasional cross-fertilization is the rule and not the exception. In a work lately published in England, and soon to be reprinted in this country, he gives the results of eleven years' practical research in regard to close and cross-fertilization. By experiments with the morning glory, and other fast growing plants, he found that self-fertilization, even when effectual, produces, in general, less vigorous plants than cross-fertilization.

The lecturer then demonstrated the means by which cross-fertilization is secured. This portion of the lecture was illustrated by diagrams; first of the *Aristolochia* or Dutchman's pipe, in section, showing the position of the anthers and stigma to be such that self-fertilization is impossible. In the common plantain the lower

flowers bloom earlier than the upper, the latter having the stigmas protruding and having at the same time the stamens tucked away in the corolla where they cannot fertilize the stigmas. The anthers mature later than the stigmas. Unless fertilized, the stigma droops, and the stamens then protrude, so as to be ready to fertilize the stigma of another blossom or another plant. The question arises how pollen can be carried from one flower to another. In the plantain it must be by the wind, for the flowers are not attractive to insects, and for the same reason all grasses and sedges are cross-fertilized in this way. The *Houstonia* grows in little patches, and it is found that in some of these patches all the flowers have protruding styles and anthers low down; while in others all the flowers have short styles, and anthers high up in the throat of the corolla. The flowers of the former cannot fertilize themselves, but must be fertilized by the other kind. The pollen of many flowers is not so potent to fertilize the ovules of that flower as the pollen from other flowers of the same species. This has been well stated by Professor Gray, as follows:— "In the blossoms of peas, beans, etc., generally little or no seed is set when insects are excluded, although the parts are so disposed that the stigma must be dusted by the pollen of the stamens enclosed with it; when, however, such stigmas are touched by the pollen of another flower it seeds perfectly." In the madder, cinchona, and ipecac, the structure of the flowers is similar to that of *Houstonia*.

In the case of ipecac plants raised in greenhouses, seed very rarely if ever sets. Professor Balfour was led to suspect the cause, and he found plants of ipecac in the other dimorphous state—that is with reciprocal styles—and by fertilizing one form with the other, fruitful seed was produced. *Lythrum Salicaria* presents an example of trimorphism, the stamens and pistils having *three* different lengths with regard to each other and to the styles, and necessitating the action of insect agency. The arrangement in the *Scrophulariaceæ*, including the *Gerardia*, and also in the *Gloxinia* and other gesneraceous plants, is the same as in the plantain, but these have the addition of color to attract insects. One of the most remarkable provisions to ensure cross-fertilization is seen in the *Clerodendron*, so well known in our greenhouses. When the flowers first open, the long styles are curved back and the stamens are straight, but afterwards the stamens curve back, and the style straightens, and the ovules cannot be fertilized by the pollen of the same flower.

In the *Kalmia*, or mountain laurel, the anther is in a pocket and held down so that the filament is bent, and when released the pollen escapes through an opening at the top. The effect is similar to that which might be produced by a boy fastening a case of shot on the end of a whalebone rod, and then bending the rod and suddenly releasing it. At first sight this arrangement might appear well adapted to secure the fertilization of a flower by its own pollen, but it is found that the pollen generally shoots clear by the stigma. When, however, an insect alights on the flower and covers the stigma, the under side of his body takes the pollen, where it is ready to be imparted to the stigma of the next flower on which he lights. That the pollen of this plant is not very potent in self-fertilization was shown by Professor Beal, who covered up a plant with gauze so that no insect could get to the blossoms, and in this case no good seed set. The barberry presents a well-known case of sensitiveness in the filaments. The lecturer called attention in passing to the curious fact, that by the application of chloroform the stamens lose their sensitiveness; the same is true also in the sensitive plant. When an insect alights on the barberry, the stamens fly up, the anthers open by trap-doors, and the pollen comes side foremost and falls on the insect instead of on the stigma. This was noticed by Sprengel, who also observed that the barberry was visited generally by sluggish insects. In the common iris, the pollen is below the stigma, and the insect in its search for nectar carries off the pollen from the anther to another flower.

But the most remarkable contrivances for ensuring cross-fertilization are found among Orchids. These are so numerous and so curious that Darwin has written a book on the subject. A species of *Habenaria* has a broad lip with an open space, on each side of which is a case containing a packet of pollen. The nectar is at the bottom of a long tube or spur, down which the insect must reach to obtain it, though some insects have become so lazy as to shirk this duty and open the base of the tube, and the same operation has been noticed in the columbine. In reaching down the tube the head of the insect comes in contact with two sticky discs, which fasten themselves to his head, and he flies with them to another flower. When these discs first attach themselves to the head of the insect, having been in a moist place the pollen-masses are damp and project from his head, but soon dry and curve downwards and forwards. The insect flies to another flower, and in seeking to

extract the nectar he places the two pollen-masses on its stigma. In the large green orchis this process can be performed with a pencil, instead of the proboscis of an insect. The two pollen-masses will adhere to the pencil, and it will leave them on the second flower and take away two for the third. In the *Cypripedium*, or lady's slipper, the insect enters a large sac so fortified that he must take a roundabout road to escape. *Cypripedium venustum* sets for insects a trap, baited with nectar. In their effort to escape, the insects detach pollen and carry it away with them to another blossom.

As the apparatus for the fertilization of orchids is more remarkable than that of any other flowers, so that of *Catasetum* is most remarkable among orchids. In this genus a part of the flower is drawn down like a spring trap, and in a warm room these stalked masses of pollen when liberated will turn a somerset, suddenly hitting the object which touched the hair trigger. If the hand is placed on this part of the flower and instantly withdrawn, the pollen will be received on the hand.

Hybridization extends beyond the limits of the species. Cross-fertilization is confined within the limits of the species, and its object is the suppression of those vagaries which we see in varieties.

The lecturer concluded by citing Mr. Darwin's general proposition relative to the subject, namely, that many plants cannot be self-fertilized. In those which can be and are self-fertilized as a rule, there is provision also for occasional cross-fertilization.

MEETING FOR DISCUSSION.

SATURDAY, January 27, 1877.

W. C. Strong, Chairman of the Committee on Publication and Discussion, presiding. Byron D. Halsted, M. S., of the Bussey Institution, Harvard University, was introduced and read the following lecture on

INJURIOUS AND OTHER FUNGI.

From the early days of botanical science, the vegetable kingdom has been divided into two grand divisions, namely: *Phœnogamous* or flowering plants, and *Cryptogamous* or flowerless plants.

It is unnecessary for us to point out illustrations of this first great group, because they are as familiar to us as household words, in the trees which spread their lofty tops above our heads, or the grass which grows in the meadows and pastures at our feet. With the cryptogams the case is somewhat different. The *Ferns*, the royal members of the cryptogamic series are, with us, only herbs of yearly growth; while *Mosses* and *Lichens* lay but a carpet on the rocks and hillsides. The *Sea-weeds*, though certain species grow large and cumbrous, are usually small, and many are microscopic, and *Fungi*, the last of all, are too often known to the natural sight only by their effects. It is to a consideration of some of the members of this last mentioned group that your attention is invited.

Fungi make up a group so diversified in characteristics that it is almost impossible to give any description of them as a whole. Suffice it to say, they are all parasites, deriving their nourishment directly from the organic substance upon which they feed, having no green leaves in which crude material can be transformed and fitted for the growth of the plant. They are all thieves, then, either stealing their sustenance from the dead, or robbing the living tissue of all its vital fluid.

Their range of growth is limited only by the boundaries of other forms of life. The housewife, to her great dismay, finds upon the top of her can of fruit a portion that is white and worthless; a plant has found its proper element and has been feeding upon her dainties. Your wine may have leaked from your cask to the cellar floor, and when you go to draw a draught, a carpet of the finest velvet has grown for your feet. Yeast is employed to make our bread light and wholesome; and myriads of little plants do the work and do it willingly. Fungi flourish upon our walls, find their way through our books, and pick to pieces the frame work of the stoutest ships. The animal kingdom is not beyond their reach, and many of its members fall victims to an overpowering vegetation; while it is a well-established fact that many of the most fatal epidemics are the result of their inroads upon the human family. Without further generalization, which is almost worthless in such a group as this, let us pass at once to the consideration of some of its individuals.

In the Mushroom, *Agaricus campestris*, perhaps as well known as Toadstool, we have a species of fungus with which every one is familiar. It is the famous *Champignon* of the French, the *Patiola* of the Italians, and was known to the ancients by upwards of a

score of synonyms, growing almost everywhere, from the chilling atmosphere of Lapland, to the hot climate of the tropics; from the Japan islands on the east, to California on the west. Though it is by no means confined to old pastures, with us it is to be found there in the greatest abundance, and especially after a warm shower in the evening. The rapidity of its growth is proverbial. If we go out in the morning we may see them in clusters exhibiting all gradations, from the young "buttons," resembling eggs in size and color, to those of middle and old age, consisting of a stalk somewhat larger than a man's middle finger, bearing at the top a broad, umbrella-like expansion, which is called the *pileus*. When young, the outer edge of the pileus is united with the stalk, but as it approaches maturity it breaks away, leaving the *ring* to mark its former place of attachment. If a full grown mushroom is taken, and the under surface examined, it will be found to consist of a multitude of radiating gills of a beautiful pinkish color. It is on the surface of these gills that the reproductive bodies are borne—bodies which, though different in structure, perform for this plant the same office the acorn does for the oak; but instead of being called *seeds* they have, in this and all other species of fungi, received the name of *spores*. At the base of the stalk, hidden from sight, is to be found a mass of fine threads which make up the true vegetative portion of the fungus, and is called the *mycelium*—a term applied to this part of all species of fungi. In France, where the satisfaction of the palate is a matter of no secondary consideration, the mushroom has received the greatest care, and been quite extensively grown. In this peculiar market gardening, caves are often put to valuable use; and old deserted mines have been appropriated for the winter culture of the champignon. The growth and consumption of the mushroom in the United States is rapidly increasing. In Italy this species of fungus is always rejected in the markets as being poisonous, while its place is filled with another upon which the French look with distrust.

The fact that some species of toadstools are poisonous, is as evident as that others possess real worth as articles of diet, bearing, as it does, the testimony of many who have ignorantly eaten of the former, supposing them to be edible. Among the illustrious who have perished in this manner, we find the names of the Emperor Jovian, Pope Clement VII, and the Emperor Charles VI. The dread of being poisoned, mixed with no small amount of super-

stition, together with the difficulty of distinguishing the good from the bad, have all combined to prevent the accordance of justice to this family of plants.

Any one who presumes to give instruction concerning fungi is expected to lay down certain infallible rules for distinguishing the edible from the poisonous, so that in the future no serious inconvenience or loss of life may arise from their injudicious consumption. Up to the present time this has never been done, and it would not become me to attempt it here. There are certain *general* rules which may be given, but they all have their exceptions, both in including poisonous species and in excluding those which experience has shown to be delicious.

Those which are bright colored, as red, blue, or green, are to be looked upon with suspicion. Those which change color when bruised, cut, or broken, are usually unfit for food. A milky juice is a bad sign. Those with a moist, waxy surface, are to be avoided. A disagreeable odor while still fresh is a *strong* indication of their not being edible. But, as has been stated, these rules are not infallible, therefore a last safeguard must be laid down, as follows: *never eat a fungus about which there is any doubt.* The best and shortest method for those who wish to make use of these plants as articles of diet, is to become acquainted with the distinct characteristics of a few of the most common edible species, and use no others.

One of the leading fungi recognized as valuable for food is the Morel (*Morchella esculenta*). It has a short, thick stem, terminating in a large ovoid top, very irregular on the exterior, owing to the many compressed folds of which it is composed, thus forming a surface of numerous indented polygons. They are found to some extent in most countries, but those in commerce come almost entirely from the states of Germany. They show a peculiar preference for those portions of woodland, on sandy soil, over which fires have passed. This fact became so evident to the peasants who gathered them, that in order to increase the range of growth they set fire to the forests to an alarming extent, and rigid laws were enacted to prevent such damage. The morel is extensively used as a flavoring for sauces and soups, but chiefly in the manufacture of one of the finest qualities of catsup.

The most highly prized of all edible fungi are Truffles, of which there are several species, the most common one being *Tuber æsti-*

vum. They are roundish in outline, of the size of a black walnut, having the surface black and much wrinkled, as if by pressure. The interior is quite solid, of a brownish color, and exhaling when cut a very agreeable odor. Their habit of growth is peculiar, as they are subterranean during their whole life, being buried beneath the soil to the depth of several inches. The condition most favorable for the growth of truffles is a soil of a calcareous nature, permeated by the roots of the oak; and the method pursued in France, the only country where the culture has proved successful, is to select the required quality of soil and sow it with acorns. When the saplings have attained a few years' growth the truffles begin to grow. Owing to the subterranean habit of the truffle, the difficulty of finding them, when growing in the wild state, is great, and to this end several processes are in vogue, one of which is quite effectual, and at the same time unique. Dogs and pigs are very fond of these delicate bits of vegetable growth, and being endowed with a sense of smell far superior to that possessed by man, are enabled to seek out the truffles in their hiding places. When the dog, or pig, as the case may be, has found the locality of the plants, he is repaid by a more available, though less palatable morsel from the truffle-hunter's hand.

Besides those already mentioned, there are many other species of fungi which have won a general acceptance into the list of those that are fit for food.

Among the poisonous toadstools the *Amanita muscaria* holds a leading place, receiving its specific name from the fact that it is sometimes steeped and the solution used in the destruction of the house fly. The pileus is raised on a long stalk, and often attains the diameter of four to six inches, having its upper surface studded with large white protuberances, making the plant, if richness of color and beauty of outline are considered, better fitted for the throne of a fairy than the stool of an ugly toad. Though so tempting in its beauty, its poisonous effects have become well understood through the sad experience of many who have eaten freely of its tender tissue, to suffer the severest pain, sometimes only relieved by death. A variety of this species grows to some extent in Northern Asia, and especially in Kamtchatka, where it is highly prized by the natives for its exhilarating effects, possessing, as it does, the power of producing a peculiar intoxication. The fungus is gathered and dried with great care, and when a state of inebriation

is desired, a small piece is swallowed, and in the course of one or two hours the drunkard is in his glory. This fungus has a peculiar effect over muscular exertion. In his "Vegetable Kingdom," Dr. Lindley tells us that a talkative person, under its influence, cannot keep silence or secrets; one fond of music is constantly singing, while he who wishes to step over a straw takes a stride sufficient to clear the trunk of a tree.

With us the *Phallus impudicus* is the most disagreeable species, and commonly bears the not over-classic name of Stinkhorn. It has a stalk five to eight inches in length, bearing at the top a small cap, which, when young, is covered with a green slime. This soon liquefies, and dropping off, covers the ground with an offensive mass, to be eagerly sought for and devoured by carrion insects. The top, when thus relieved of its green outer covering, exhibits a honey-combed surface, and exhales the most disgusting of odors. Many stories are told of the encounters botanists and others have had with this peculiar plant. A case is related of an enthusiastic botanist, who, while on a tour, found some of these plants of unusual size, and wishing to preserve them, placed them in his box; returning home by rail they caused such discomfort to the inmates of the car that every occupant left it with amazement and disgust as soon as possible.

Let us now turn our attention to some of those smaller members of this assemblage of plants, which more truly deserve the name of *Destructive Fungi*, and therefore fall more particularly within the province of this lecture.

The bread, cheese, and cake moulds, though belonging more strictly to household economy, are not without their influence upon the fruits of the horticulturist, and for this reason warrant a passing mention here. They only grow upon organic matter after life has become extinct, but in their growth they rapidly hasten decay, and in this way often do serious damage to fruits and vegetables. An explanation of the cake mould, *Eurotium Aspergillus glaucus*, will answer for them all, though among these little plants great differences are to be observed. The general appearance of this little blue intruder is so familiar to you that a description of it as seen by the naked eye is unnecessary. Under the microscope, the little specks resolve themselves into small heads of radiating cells. These cells are formed one upon another from the filaments, and are spores, but of that kind known as conidial or asexual spores. On

other *mycelial* threads, at the base of the stalks bearing these conidial spores, the true sexual spores are produced in something like the following manner: Certain filaments first begin to coil up into a close spiral, after which another thread grows up and touches the tip of this coiled filament, and fertilization takes place, a process essentially the same as the pollenization of the ovule in flowering plants, though differing in method and results. After this fertilization, sacs or cells arise from the coil, in which spores are formed, and the whole coil and sacs of spores become surrounded by a covering of cells. On account of the sexual spores being borne in these sacs or *asci* this fungus comes among the *Ascomycetes*, one of the highest groups of fungi.

We come now to speak of species of fungi which flourish on living tissues, and on these only, including, therefore, the most destructive members of the group.

Puccinia Graminis, one of the most widely distributed and generally known, is one of the many species of that destructive agency which is often vaguely spoken of as Rust. All agriculturists who have made the raising of grain their leading employment, will at once turn in thought to the time when their whole field of growing wheat or oats, the pride of their vocation, was turned, as by the stroke of some unseen demon, into a yellow, premature old age.

The different stages in the growth of this plant are quite distinct and peculiar, and though somewhat complicated, it would not be justice to the plant or to science to omit the history of the forms through which the rust plant passes from the perfect state to the perfect state again.

The transformations in the life of a butterfly are so evident that the merest schoolboy may observe the truth for himself; but with the rust plants the objects are so very small that the changes can only be seen by the keen eyes of a skilled observer, with the best powers of the microscope. Beginning with the spores of the mature rust plant, as seen in the black stains on the old stubble of any grain field, it will be found, when the warm and moist days of spring come, that these spores germinate, producing in a few days a short stem, bearing a crop of other spores of very much smaller size. To avoid confusion we will call these by their scientific name—*sporidia*, while the parent spores are styled *teleutospores*. The sporidia have never been known to grow upon the grass or grain; but when they find their way to the leaves of a barberry bush they soon begin to

germinate, the filaments enter the tissue of the leaves, and in the course of a few days make themselves manifest on the under surface of the leaves, in what are known as "cluster cups." The interior of these pretty little cups is closely packed with spores of a still different kind, which are called the *æcidium* spores. These in turn will not grow upon the barberry, but when they fall upon a blade or stalk of grain, they soon germinate and produce the yellow, rusty covering so often seen, caused by a multitude of another form of spores, called *uredo* spores, clustered upon the surface. In this, the true rust state, the fungus first consists of minute filaments, which run in all directions through the tissue of the grain plant, stealing its nourishment as they go, and is noticeable to the naked eye only when these threads break through the epidermis and bear the yellow or orange uredo spores. The rapid and destructive development of this fungus depends much upon the weather. Should there be a series of warm showers, or a muggy atmosphere, just at the time the grain plant begins to form its grain, the growth of the rust plant is especially favored. It absorbs rapidly the food which is on its way to the seeds, and uses it up in producing a vast number of spores upon the surface of the leaves and stalks, at the expense of an empty head of husks at the top. Later in the season, from the uredo state the final perfect teleutospores are produced, thus completing the circuit of life in this little rust plant. Long before rust was discovered to be a plant, farmers had noticed that there was a close relation between it and the barberry; and at present the latter is being rapidly destroyed, with good results, though it can scarcely be expected that the rust plant will thereby become extinct, as probably the æcidium state grows on other plants than the barberry, though not as yet discovered elsewhere.

This plant is an excellent illustration of polymorphism, so common among fungi, and it also answers well to show the vast number of spores these microscopic plants produce. The teleutospore usually bears from five to ten sporidia; and allowing only one of these to find the barberry leaf, there may be from one to fifty clusters as a result. In this case suppose only one, and a very low estimate for its contents would be 250,000 æcidium spores, and if only one of these in a thousand finds a place on the grain stalk, and each brings forth its 250,000 fold, there would be, under such circumstances, 62,500,000 from the single one from which we started. Taking the same teleutospore, and supposing every spore in all the stages found

its place to fill it, the result would be 1,562,500,000,000,000,000 (one quintillion, five hundred and sixty-two quadrillions, five hundred trillions) spores, which may be looked upon as its descendants for the season. Or giving each inhabitant of the globe his equal share of these reproductive bodies, he would have nearly as many as there are individuals in the whole human race. This may seem like a very large story about a very small matter; but it is not the only wonderful truth the microscope has revealed.

It is much easier to tell in what rust consists than how to avoid it. Knowing the nature of the plant, and that in one of its stages it grows upon the barberry, the cutting away of all barberry bushes may do much to check this unwelcome pest, if not to improve the landscape and the general appearance of the farmers' boundary lines. As to the best time to sow a crop to avoid the rust, little information can be given. Sow when you would expect the best returns were there no such thing as rust. Many trials have been made of soaking seeds in various chemical solutions before sowing, but, from the nature of the parasite, little good is to be hoped for from such a practice. Until the weather is under man's control we cannot hope to eliminate the conditions for the rapid development of rust, causing, as it will, a partial or entire failure of the grain crop.

The *Ustilago maydis*, generally known as Corn Smut, is another of these microscopic plants which often grows in fields of maize. Though less prevalent than the rust, it is, like that, a sworn enemy of the agriculturist. Sometimes it makes its appearance only at one or two of the joints, causing a bending, so that the stalk frequently reclines on the ground. Again, it seems to take possession of the whole plant while it is still quite young, and as a result there is only a dwarfed and rotten mass, but a few inches above the surface of the soil. The greatest damage is done when the thief takes possession of the kernels while they are still quite young, transforming their tissue into its own long mycelium threads, which at maturity produce, in infinite numbers, the minute blackish spores. Frequently, only a few of the grains are affected, making a striking contrast with those of natural size. It was long supposed that this smut was a diseased state of the corn plant; but there is no longer reason to doubt that it is a small, dirty plant, growing at the expense of one of the most useful members of the vegetable kingdom. Vegetation and reproduction in these plants are reduced

to their simpler forms, and the space from the time when a spore germinates to the time when spores are again formed may be reduced to weeks, and even days, instead of being months and years as in plants of a higher and more complex organization. The grains of corn that, to the naked eye, appear perfectly free from the smut, may have their tissue interwoven with its mycelium threads; and when the grains thus affected are planted, the fungus is planted with it, and as the corn plant grows so does the parasite, until the presence of the latter becomes evident in its black, dusty fruitage. This is one of the methods of propagation which is of great importance to the existence of the smut plant. As with the rust, there seems to be no available method of staying its ravages when moist and warm weather comes at just that season of the year best fitted for its rapid development. Still, much could be done to reduce the number of its reproductive bodies, by cutting off and burning the affected portions before the smut plant has ripened its spores. Concerted action is required in a movement like this; and when farmers, as a whole, see that it is for their interest to go through their fields of growing corn, and destroy this pest in its early stages of growth, we can assure them that from that day on they will have more and better corn for their labor.

In all cereals to some extent, but especially in the rye, may frequently be found a fungus which has long been known under the name of Ergot (*Claviceps purpurea*). Like the corn smut, this plant attacks the young grain and causes it to assume a very much enlarged form, protruding far beyond the husks and resembling a cock's spur, whence its common name "spurred rye." The whole enlarged mass is made up of hard mycelium, on the surface of which the conidial spores are borne. The fungus may exist in this indurated form for a long time without further development, but when these ergot grains fall upon moist earth, sprouts soon proceed from them which form club-shaped heads at their extremities, in which spores of the second form are produced in little sacs. These different forms were for a long time considered distinct species; but the hard state, that in which ergot exists as sold in the shops and used in medicine, is only a form which many fungi have the power of taking on when they prepare for a season of repose. Ergot is one of the most poisonous of the smaller fungi. In several provinces of France and Germany, epidemics of nervous derangement, resulting in gangrene and frequent loss of limbs and even of life, have

been traced to the consumption of this plant in the bread made from rye which was largely spurred, the result of an extremely favorable season for the growth of this pernicious fungus.

It is to be presumed that no one species of plant has caused so much suffering to the human family as *Peronospora investans*, or Potato Rot, as it is called in common parlance. Those of you old enough to glance back in memory to those fatal years for Irish peasantry, when their almost sole source of sustenance was swept from them by the ravages of the rot, can form an idea of the influence even a microscopic fungus can exert over the comfort and civilization of the race. The potato rot is one of those small microscopic fungi best known to the naked eye by its terrible effects. Its first general appearance was in the year 1845, when it was first seen in the Isle of Wight and a few weeks after was observed with great wonder and dismay by all growers of the potato throughout Europe. It is a plant which flourishes only in damp weather, and its prevalence depends much on the condition of the atmosphere. The fungus is first recognized by the potato leaves turning brown, owing to the absorbing threads of the "rot" within the tissue. Soon certain threads come to the surface, pass through the breathing pores, divide into several branches, and bear the conidial spores on the tips. In this condition the leaves look as if covered with a fine frost. The spores thus produced germinate at once, and in this way the disease is rapidly spread to other plants throughout the field. The fungus soon passes down the stem to the growing tubers, and they in turn give up their substance to this parasite, and then become rotten. As the rot does not make its appearance until the hot and moist days of July, the earlier varieties stand a greater chance of escaping it than the later. In all cases where the disease is gradual in its appearance, and the tubers are nearly mature, they should be dug at once. If the fungus has reached the tubers they will rot to some extent; but when placed in a dry cellar the rotting is considerably retarded. In raising potatoes, select a well drained or naturally dry soil; plant early varieties and plant them early. Always plant the soundest and most mature tubers. Gather the crop as early as possible and burn all tops at once, thus destroying the spores which might otherwise carry the pest over the winter season. When every condition is the most favorable for its development the rot will take its most violent form, and the crop will fail as it has so often done in the past.

The potato rot has long been known to the South American Indians dwelling in the regions of the Andes, showing that this plague is not of recent origin, and also that the land which gave us the wild potato has likewise produced its most destructive parasite, which has followed it across the seas. There is no object in nature concerning which men have given more curious and conflicting theories than the plant in question, and to-day the list is long of those who fail to recognize in it a member of the vegetable kingdom. But when the plant can be cultivated, the spores sown on sound potatoes, and the vegetable watched through its whole existence, culminating in the rot, it is time to believe that it is as much a plant as the one upon which it grows.

Another species of this same genus, *Peronospora*, is the American Grape-vine Mildew. The true grape disease, the one which has proved so disastrous at different times to the vines of Europe and Madeira, is caused by another fungus, to which Berkeley has given the name of *Oïdium Tuckeri*. It is a form of a fungus which has not been recognized in its perfect state, and is supposed to occur to some extent on this side of the waters; but as many species have this conidial form, and some nearly identical with it, and also growing on the grape, there may be some doubt as to our vines ever being attacked by the true grape disease of Europe. The *Peronospora viticola*, the mildew which most interests the grape growers of America, is quite common, appearing on the under surface of the leaves about the first of August, and continuing to flourish until the leaves will nourish it no longer. It can be most easily seen on the smooth leaves of the *Vitis cordifolia*, having the appearance of small, frost-like spots, which rapidly spread and soon cover the whole leaf, frequently extending down the petiole to the stem. This fungus, like the potato rot and other closely-related species, flourishes best in moist, warm weather. Under the microscope, the tissue of the grape leaf is seen to contain an abundance of minute threads, which force their way in all directions between the cells of the leaf, thrusting their suckers into the cells to rob them of their nourishment. When the time for fruiting comes, the threads pass out of the stomata of the leaf and branch in a definite manner, and bear the asexual spores on their tips, as we have observed in the potato rot. Under the head of the germination of these asexual bodies, Dr. Farlow has performed some interesting experiments. He finds they germinate equally well in the dark as in the light. Those

sown in the morning germinate more quickly and abundantly than those sown in the afternoon. It was not possible to keep the spores which were formed in the night until the afternoon, as they generally fell from their attachments in the morning and began to germinate. In all cases the germination took place with surprising regularity. At the expiration of an hour and a quarter the contents of the spores had formed small oval bodies, which, before long, ruptured the cell wall and made their escape from the mother cell. They passed out rather slowly, usually one at a time, and paused for a moment in front of the opening, where they remained as if not quite free one from another. In a short time, each body began to extricate itself from the common mass, moved more and more actively, and finally darted off with great rapidity—a full-fledged zoöspore, furnished with two cilia. The average number of these rapidly-moving spores is from six to eight. Their movement gradually grows slower, and in from fifteen to twenty minutes they come to rest. Soon an outgrowth proceeds from one side and rapidly develops into a new plant. The sexual spores are found in autumn, within the tissue of the shrivelled leaves, as spherical, thick-walled bodies. They escape by the breaking up of the dry leaf, or through the decay of the surrounding tissue. The statement is often made that the mildew does not grow on the *Vitis vinifera*. By carefully conducted experiments, Dr. Farlow found it could be made to grow on the leaves of this European species, and with the usual luxuriance.

The Black Knot, to quote from Dr. Farlow's excellent article on this subject, published in the "Bulletin of the Bussey Institution," Vol. I, p. 440, is "without doubt the most striking disease of vegetable origin occurring on fruit trees in this country. The disease takes its name from the unsightly, black, wart-like excrescences, with which every one is familiar on plum trees and different kinds of wild and cultivated cherries. It is found in all parts of our country, east of the Rocky mountains, and is so common and destructive that in some districts one seldom sees a plum tree free from the knot. In some parts of New England, particularly in Maine and along the sea-coast, the raising of cherries has also been almost abandoned in consequence of the ravages of the black knot. The disease is peculiar to America, and has been the bane of fruit-growers from early times; and although much has been written in agricultural papers about its injury to the fruit crop the subject has been almost

entirely neglected by botanists. As a preliminary step it will be well to trace the development of the knot as it occurs on a single species, and for this purpose the choke cherry (*Prunus Virginiana*) may be selected." The size of the knots varies greatly, being found on the species of *Prunus* under consideration all the way from a few lines to several inches in length, with an average of two inches in circumference. The knot does not usually entirely surround the branch, but, growing from one side, often causes the stem to bend or twist into an irregular shape. In the winter, when the branches are leafless, the knots are much more noticeable, and at this season they are often cracked, broken, worm-eaten and hollow.

In the swollen portions of the branch, above and below the knot, sections under the microscope show the vegetative portion of the fungus in the form of minute threads, twisted together and extending from the cambium towards the outer portion of the stem, where they become separated. The fungus first reaches the cambium, either by germination of spores on the surface of the branch, or by mycelium proceeding from a neighboring knot. The part of the cambium free from these bundles of mycelial threads, grows in the usual manner; and in an old branch shows one more layer of wood on the sound side than on the diseased side. From this it is to be concluded that the growing layer of tissue of the plum or cherry branch, is the place in which the fungus begins its destructive work. In the spring the swollen portion of the branch increases in size, and the mycelium soon reaches and bursts through the bark, so that by the time the choke cherry is in flower the knob has reached nearly its full size, though differing from an old one in being still greenish in color and solid or pulpy in consistency.

With a hand lens one can see small hemispherical protuberances which are the beginnings of the "perithicea," or pits in which the sexual spores are to form. The whole surface of the protuberances is covered with filaments, which are somewhat flexuous and branched. At the terminal joints, or frequently a little to one side, conidial spores are borne. These spores continue to be formed until near the close of summer, when the filaments dry up and only their shrivelled remains are to be seen. The knots now assume their black color, the inner pulp being either destroyed by insects or reduced to a powdery mass, with only the hard outer shell which contains the perithicea left in place. About the middle of January the spores in the sacs in the perithicea begin to ripen.

The knots on the choke cherry when compared with those on the plum and cultivated varieties of cherry are seen to be slightly different in general appearance, but when viewed with the microscope all prove to be identical, the difference noticeable to the naked eye being due to more favorable circumstances for its growth afforded by one species of *Prunus* than another.

Dr. Schweinitz was the first to describe the fungus causing the black knot, under the name of *Sphœria morbosa*.

The black knot is far from being of recent origin, and has furnished a subject about which vastly more has been written than was known. Many, especially the early writers, held it to be of insect origin, while, later, others have looked upon it as a vegetable growth, and still others include in its production both these forms of life. During the last thirty years the insect theory has been gradually given up by the entomologists, but it still remains for many fruit growers to accept the knot as being of fungous origin. The proof given by Dr. Farlow is very conclusive on this long disputed point. "First, the knots do not resemble the galls made by any known insect. Secondly, although insects or remains of insects, are generally found in old knots, in most cases no insects at all are found in them when young. Thirdly, the insects that have been found by entomologists in the knots are not all of one species, but of several different species which are also found on trees that are never affected by the knot. On the other hand, we never have the black knot without the *Sphœria morbosa*, as was admitted by Harris, and the mycelium of that fungus is found in the slightly swollen stem long before anything which could be called a knot has made its appearance. Furthermore, the *Sphœria morbosa* is not known to occur anywhere except in connection with the knots."

With a knowledge of the nature of this contagious disease, the remedy at once suggests itself, namely, to cut off the knots, together with the swollen portions of the branches, whenever and wherever they are found. In autumn, as soon as the leaves fall, the knots can be most easily seen, and all branches bearing them should be cut off and burned at once. Though the sexual spores do not form until late in winter, it was carefully observed that were the knots left undestroyed they would ripen after the branch was cut from the tree. The choke cherry, bird cherry, and wild plum furnish means for rapid propagation of the knot, and they should be gladly sacrificed for the good of their more worthy allies. Knowing the cause,

nature, and means of propagation of the black knot, it is for the fruit growers to profit by their instruction and use their best endeavors to destroy this pest. It is now peculiar to America, and any means of introducing it into other countries should be carefully avoided.

In concluding this general and very incomplete account of fungi, perhaps it will not be more than justice to give a notice of some of these parasitic plants which prey upon living animals.

Who has not seen house-flies in autumn, crawling slowly upon the wall with their bodies covered with a white powder, making them appear as if they had paid a visit to the flour barrel; or, later still, found them fastened in death to the wall or window-pane? The struggle between the animal and vegetable has been won by the latter, which in turn must also perish when the substance of the fly is all destroyed. The tender and valuable silk-worm has long been subject to epidemics, by which large quantities have perished, causing such fluctuations in the price of silk that the trade in this product has frequently been threatened with a panic. The fungus, which is commonly called *muscardine*, begins its growth within the body of the insect, soon to increase in size and burst through the skin, thus producing death.

One of the most curious of these insect infesting or carnivorous fungi grows upon or from the head of the larva of a certain species of moth. It is an amusing sight to see the heavily burdened larva bearing erect upon the front of its body a vegetable growth, often three or four times its own length, the signal of distress as it must be, telling plainly the slow but inevitable approach of death.

Thus we have seen that the members of this peculiar group of plants which has received the name of fungi, are all parasites, and from their very nature do not increase the amount of organic matter in the world, but on the other hand, are powerful reducing agents, seizing upon that which is highly organized, and aiding rapidly in its reduction to a more simple state.

Though fungi furnish delicious articles of food, it is in the light of their power to hasten decomposition that we see their great importance in the world; aiding in the cycle of life by facilitating decay. Sometimes they encroach upon our fields of growing grains and fruits and do us serious damage; but even here the moralist would say there is a lesson of appreciation and care for our crops, which only the school of sad experience is able to teach.

The lecture was illustrated by large diagrams of the different parts of several fungi, and also by specimens preserved in alcohol and others mounted on cards. Some of the diagrams are reproduced here.

Explanation of the Plates.

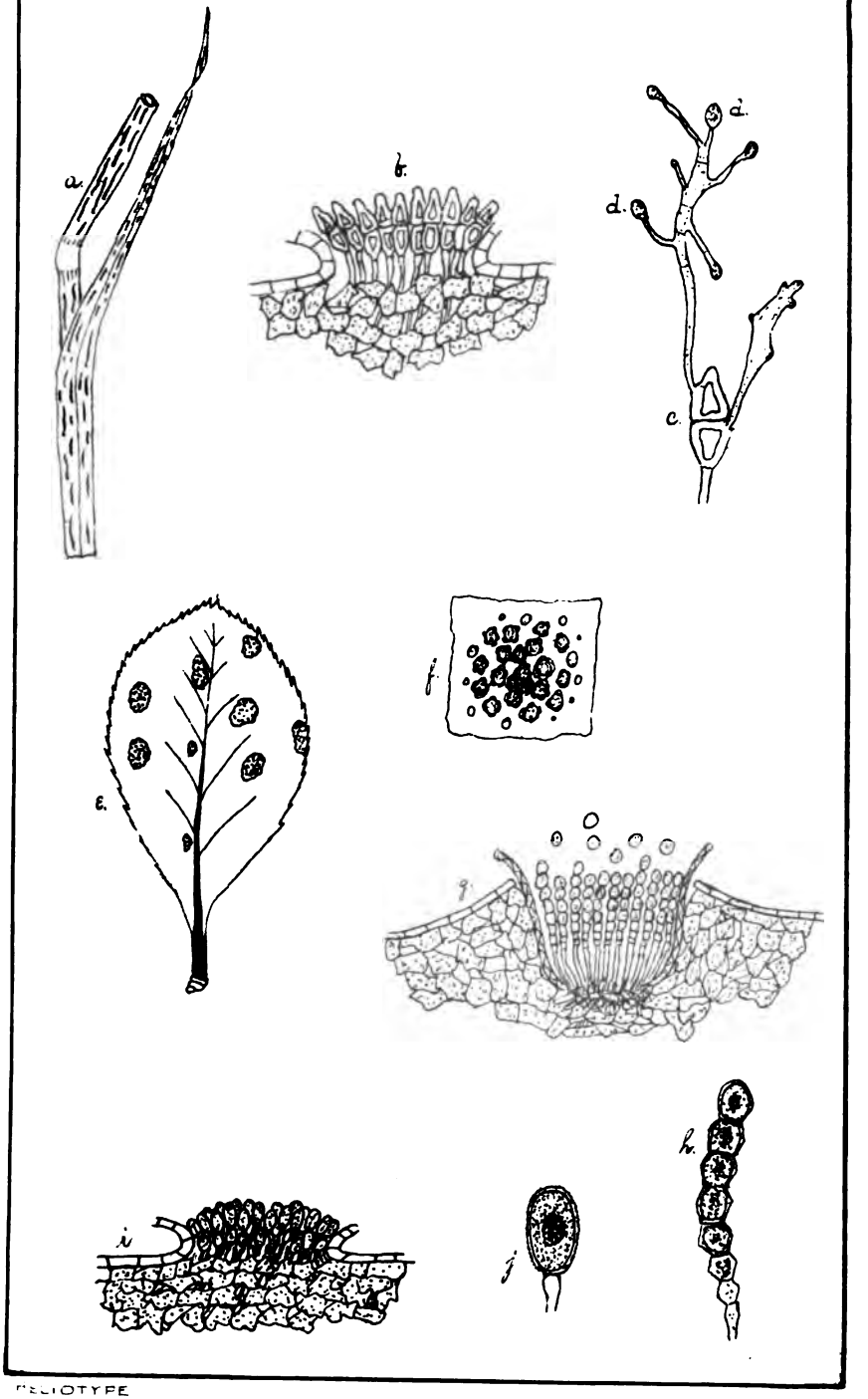
Plate I. Wheat Rust (*Puccinia Graminis* Pers). Figure *a* represents the teleutospores, or perfect state of the rust, as seen on the stems and leaves of grains and other grasses, at the close of the season and early in spring; *b* a cross-section of the outer portion of the stem, highly magnified, showing the ripe teleutospores after they have burst the epidermis; *c*, teleutospores germinating and producing the sporidia *d d*; *e*, barberry leaf, showing the underside with its "cluster-cups" (*æcidium* form); *f*, one of these cluster of cups somewhat enlarged; *g*, a mature cup in cross-section; *h*, one of the rows of spores as formed in the cup, highly magnified; *i*, a magnified cross-section of grass leaf, with the *uredo* state of the fungus after the spores have burst through the epidermis; *j*, one of the uredo spores more highly magnified.

Plate II. Grape Mildew (*Peronospora viticola*, B. and C.) *a* represents a leaf of *Vitis cordifolia* affected by the mildew; *b*, a cross-section of a grape leaf, much magnified, showing the filaments of the fungus in the tissue, from which they finally pass out through the stomata and form the *asexual* spore bearing the branched top c; *d* is a highly magnified view of the filaments in the leaf, with their *haustoria* or "suckers," *e e*, penetrating through the neighboring cell-walls; *f*, one of the sporangia from *c*, highly magnified, and dividing up into zoöspores; *g*, a zoöspore; *h*, a large *sexual* spore, separated from the grape tissue in which it is formed.

Plate III. Black Knot (*Sphæria morbosa* Schw). *a* represents a mature black knot; *b*, a cross-section of the same, and the stem which bears it; *c*, enlarged view of first form of asexual spores, borne on filaments over the surface of the knot; *d*, *stylospores*—a second form of asexual spores formed in pits of the knot; *e*, a perithecium in cross-section, showing the sexual spores borne in sacs; *f*, two of these sacs with their spores, highly magnified, and a number of *paraphyses*, or sterile threads, around them.

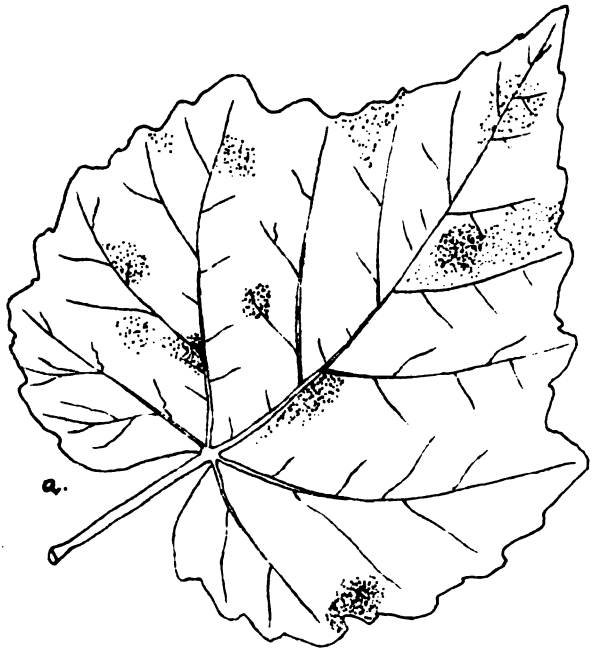
Figures *d*, *f*, *g*, and *h* of plate II, and *b*, *c*, *d*, *e*, and *f* of plate III, are drawn from figures by Dr. Farlow, in Vol. I, Part V, of the "Bulletin of the Bussey Institution."

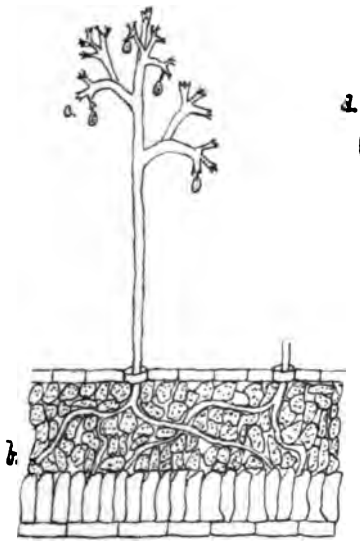
PLATE I

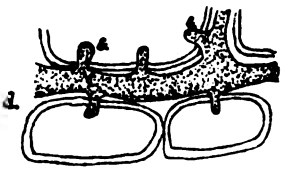


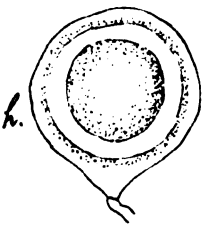
HELIOTYPE

PLATE II









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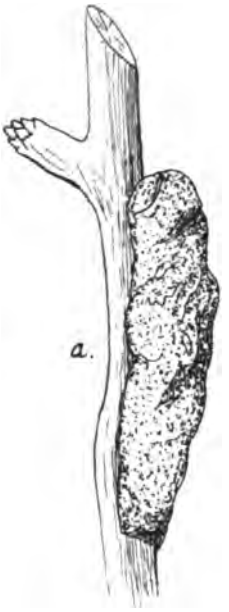
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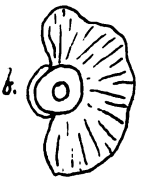
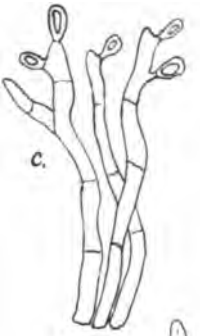

b.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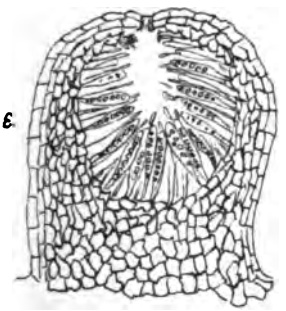
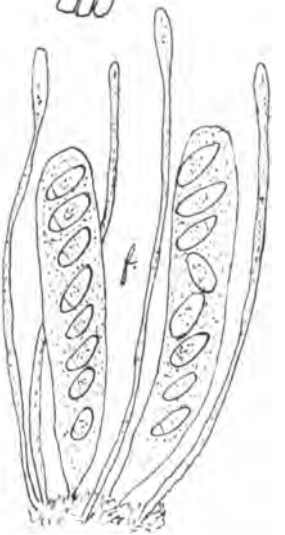
d


e.


f.

DISCUSSION.

Marshall P. Wilder thought Mr. Halsted's remarks on the plum wart the soundest and most practical he had ever heard in so few words. He alluded to a paper on injurious insects, by Dr. T. W. Harris, published in the "Proceedings of the American Pomological Society," for 1854, in which Dr. Harris recognized the presence in the plum wart of the *Sphæria*, and also of insects, but did not consider either of them the cause of the warts.

In answer to an inquiry, Mr. Halsted said that the potato rot was largely propagated by immature and affected tubers, with the mycelium running through every part, but its presence is unknown when the tubers are planted, and until it is too late to apply a remedy. He was doubtful whether the solution of lime, which has proved effectual in preventing mildew on grape vines, would prevent the potato rot, though there could be no harm in making the trial. The change in the color of the leaf is a manifestation of fungus all through the plant, and the whole thing goes in a day.

Augustus T. Perkins suggested soaking the seed after cutting, in a solution of sulphur.

Mr. Halsted said that the fungi are the toughest of all plants, and any solution strong enough to destroy them would destroy the plants on which they grow.

The Chairman remarked that farmers had sometimes saved their crops of potatoes by mowing the tops.

Mr. Halsted said that the foliage contains the fruiting part of the fungus and that consequently mowing would prevent the spread of the disease.

The thanks of the meeting were voted to Mr. Halsted for his interesting and instructive lecture. The Chairman announced that at some future time the subject of the lecture would be further discussed.

BUSINESS MEETING.

SATURDAY, February 3, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President Parkman in the chair.

WILLIAM J. VASS, of Dorchester, having been recommended by the Executive Committee, was duly elected a member of the Society.

William C. Strong, Chairman of the Committee on Publication and Discussion, presented the following vote which was unanimously passed.

Voted, That the thanks of the Society be presented to Professor Goodale for his very instructive and suggestive lecture upon Fertilization and Cross-Fertilization, so generously delivered by him before the Society on Saturday, January 20.

The following letter from G. F. B. Leighton, President of the Norfolk Horticultural and Pomological Society, and a Corresponding Member of this Society, was read by the Secretary.

NORFOLK, VA., Dec. 6th, 1876.

To the Officers and Members of the Massachusetts Horticultural Society:

GENTLEMEN: — In response to the compliment of electing me a Corresponding Member of your society, I most cheerfully note what has passed under my observation during the past season.

Windbreaks. I have one thousand Bartletts on the north side of a thorough windbreak, reaching to the height of sixty to seventy feet, and have on the south side of said break about seven hundred of the same variety. The darkies pronounce the south side a jacket warmer in the winter than the north side, and yet there was no perceptible difference in the time of blooming last spring, while in the maturing of the fruit there was the difference of one week in favor of the south side; the greatest value, however, is in the prevention of premature dropping of fruit from gales, etc.

Blight. Under the head of this insidious disease, I notice after a warm spell in the spring, followed by cold nights and warm days, that it makes its appearance, and the greater the difference of temperature between the night and day, the more violent the attack. When the difference was over thirty-five degrees, close watching became necessary.

From reports of several parties, I am quite inclined to the opinion that the application of boiled linseed oil may in many, if not in all, cases of blight, arrest the disease. I shall try the experiment if blight is apparent next season, and as sulphur is so obnoxious to the insect family I shall add that to the oil, on a portion.

I predict a good run in the south for Clapp's Favorite. It proves very healthy — fruit not as large as in its native state, — but of

handsomer shape, and ten days ahead of the Bartlett. It is tardy in coming into bearing as a standard, but as a dwarf bears as early as any other variety. I probably have two hundred dwarfs of this variety, and as yet have not lost one from any cause. Their plantings range from three to eight years. They require heading back for four or five years to form a compact head, which is more desirable with us than with you. My standards are often taken for apple trees, for they really look to the unpractised eye more like apples than pears. As I gather the fruit ten days before maturity I have never seen one rotten at the core.

The past season has furnished an increased supply of injurious insects. Crickets have quadrupled their numbers and attack a pear as soon as it touches ground. The brown or house wasp has greatly increased and stings the growing pears, causing hard lumps and imperfections. Grasshoppers have increased and have done considerable damage to the kale crop the past fall. The potato bug has not yet put in an appearance.

Spring frosts have prevented me from placing fruits upon your tables the past three years, but I hope another spring will inaugurate a change. I fear the denuding of our forests has an influence in producing these results, the axe of the slayer being in constant motion.

Thanking you, and your most efficient Treasurer, Mr. Buswell, for copies of your valuable TRANSACTIONS to myself and the Norfolk Horticultural and Pomological Society,

I remain, with highest esteem,

Your obedient servant,

G. F. B. LEIGHTON.

Adjourned to the first Saturday in March.

MEETING FOR DISCUSSION.

This meeting was organized for the purpose of listening to the Essay on the Improvement and Ornamentation of Suburban and Country Roads, by Dr. Slade, for which a prize was awarded by the Committee. The essayist not having arrived at the close of the business meeting, the subject of pear tree blight, mentioned in Mr. Leighton's letter, was taken up.

C. M. Hovey said that the subject had been frequently discussed without discovering its cause. The disease had made its appearance this year in Arlington and neighboring towns, and had nearly destroyed whole orchards; and, if it continued, would much lessen the value of the pear as a market fruit, and we should be obliged to substitute the apple.

W. C. Strong thought the lecture of Mr. Halsted suggestive in regard to the blight. The plum wart is now known to be caused by a fungus, and the prevailing impression as to the cause of blight in the pear tree is different from that formerly entertained; it is also believed to be caused by fungus. The theory that it is caused by frozen sap is giving way to the fungus theory.

Hervey Davis thought that good cultivation would prevent blight. In his observation it had been most prevalent in low, wet, clayey ground. In George Hill's grounds, at Arlington, apple trees, especially the Porters, had been injured by blight similar to that of the pear—some of them quite seriously. Mr. Davis had never heard of blight affecting the apple in any other instance.

John B. Moore said that some of the best cultivators had suffered most. Among those at Arlington who had suffered severely, were Mr. Crosby, whose land was low, and Mr. Fillebrown and others, whose soil was sandy.

Josiah Crosby wished it was true that either wet or dry soil would prevent blight.

Mr. Hovey said that western cultivators find orchards in grass less subject to blight than when the land is tilled. The best preventive is to grow trees without manure. The frozen sap theory is now exploded. Trees just imported from France have been found affected. Mr. Locke, of Belmont, had suffered more than any other cultivator in this vicinity. Mr. Barry, of Rochester, was surprised that limbs affected with blight were not cut off, but Mr. Locke, who began cutting off the limbs immediately on the appearance of blight, soon found that he must cut at the bottom of the tree. Cultivators should be observant of the conditions under which blight attacks their trees. Last summer was unusually hot—the days especially. The speaker believed the blight to be caused by a miasma arising from the ground, and the sun shining through these exhalations caused the tree to become scorched, but we are no nearer to a certain solution of the matter than we were twenty-five years ago.

Mr. Strong hoped that none would draw the inference from the remarks made, that the pear was doomed. He believed the injury experienced last year to be exceptional, and that in future we should be free from it.

Dr. Slade, having arrived, was introduced by the President and read the following Essay:

The Improvement and Ornamentation of Suburban and Country Roads.

BY DANIEL DENISON SLADE.

It may be readily conceded that nothing concerns a people more essentially than the sure and easy means of communication between the different sections of their country, and nothing more certainly marks their progress in civilization, than the condition of their highways. In an inaugural address, a former chief magistrate* of this state, says:

"Those of our citizens who have visited Europe are unanimous in the opinion that our public roads are far inferior to those of other countries, where the means of easy and safe communication are better appreciated. The science of road-making is apparently not well understood; or if it is, the present modes of superintending the construction and repair of roads are so defective, that the public suffer to an extent of which few of us are aware. It may be found, upon investigating the cause of our miserably poor and ill-constructed roads, that the laws relating to this subject need revision, so as to give more uniformity in the construction and the repair of our highways."

In an essay of this character, however, it cannot be expected that we should advance the laws which govern the operations of the civil engineer, nor are we called upon to produce an elaborate treatise upon road-building. Such treatises, for which prizes offered by our legislature have been awarded to successful competitors, have already been written within the last few years. Moreover, excellent standard works on the subject exist in almost every language, and may be easily obtained and consulted.

It is left for us, therefore, to state in general terms, what are the

* Gov. Claflin, 1869.

characteristics of good roads, how they are to be constructed or improved and properly maintained, wherein lie our deficiencies and in what way these may be remedied—and finally, to what extent and in what manner the æsthetic principles are to govern.

The characteristics of a properly constructed and well laid-out road consist in a road-bed presenting a uniform, smooth, and level surface, with a slight convexity at the centre, of a firmness sufficient to sustain the weight of heavy loads without yielding, of a longitudinal grade not exceeding the minimum possible under the circumstances, of a width commensurate with the amount of travel and the proximity to a populous centre, and of a course as direct as practicable from one given point to another.

In order to secure the first desiderata, viz., the requisite firmness and smoothness, there must be the most thorough drainage, no matter of what material the road-bed is constructed. Through neglect of this most essential point, the result of a false economy, the building of a road often proves an entire failure. In all cases, both surface and under-drainage *must* be provided, necessitating of course the construction of proper culverts, embankments, and ditches; the first providing against damage from the rainfall, and the latter against excess of water in the road-bed or in the soil beneath.

Modern experience has taught that the best roads are those constructed according to the plans of Mr. Telford, in England, and which consist of two component parts — a foundation, and a superstructure. The foundation is made up of broken stones of the dimension of about twelve inches, laid lengthways across the road, and their interstices filled with broken fragments, with a slight lateral inclination from the centre.

The superstructure consists of an even layer of stones broken into angular fragments of not more than two and one-half inches in diameter, and forming a depth of between three and four inches. Over this is to be spread a coating of fine gravel, which having been well moistened, is to be rolled until it presents a perfectly smooth and level surface. Whatever may be the materials used for the superstructure, the foundation, such as we have described, is indispensable.

As regards the proper longitudinal grade of a road-bed, it is impossible to give any fixed rules that are applicable under all circumstances.

"We can better afford to increase the length of a road consider-

ably than to retain grades, in places, so heavy that a team is unable to haul more than half, or perhaps one-quarter, the load it can on all the remainder of it. Roads which are steep in the line of their axis are not only more severe on teams, but they are dangerous, and much more expensive to keep in repair."*

"The useful deduction from experiments and from practical experience is, that for a well-made road, with a hard and compact surface, the inclination ought not to exceed one in thirty, and for ordinary gravel roads one in twenty.†

"In treating of roads it often renders the subject much clearer to divide them into three classes: first, second, and third class roads, or, as we might also say, state, county, and town roads. Accepting this nomenclature, we have this: for first-class or state roads, the greatest inclination should not exceed from three to five in a hundred; second class or county roads, from five to seven in a hundred; third class or town roads, from seven to ten in a hundred. A road rising ten in a hundred is not supposed ever to have any heavy teams upon it. In ascending a hill it is well and proper to decrease the grade as the top is reached, and in the same measure as the horses get tired."‡

The transverse grade of the road-bed, or its cross-section, should form an arc of a circle of about ninety feet radius. In other words it should be just sufficient to allow the rain-fall to run off at the sides. If the inclination at the sides is greater, the travel will constantly seek the centre, to the gradual injury of the superstructure of the road-bed.

The laying out of a road, both as to its direction and necessary width, requires the best engineering skill. As a general rule, the first should be as direct as possible from one given point to another, the chief object in view being to carry the most in a given space, at the least expense of either time or money. This rule is especially applicable to all suburban roads and to those which may be classified as state or county roads.

Under the term width, should be included that between the fences or boundaries, and the width of the road-bed itself. Too great a width of the latter is not desirable, as the cost of maintaining it is much increased; and it is far better to have a good road-bed of suf-

* Report of the U. S. Commissioner of Agriculture for 1868, p. 358.
† Third Prize Essay, Mass. Agricultural Report, 1869-70, p. 289.
‡ First Prize Essay, Mass. Agricultural Report, 1869-70, p. 209.

ficient width than a poor one of too great width. "The width of first, second, and third class roadways, may be given as twenty-six, eighteen and a half, and thirteen feet, with a tendency during the last ten years to have none, except in the vicinity of cities, wider than twenty-four feet, and the rest correspondingly narrower. In view of the changes constantly going on in this country in the value and settlement of land, it would probably be well always to *lay out* a road fifty or sixty feet wide, but to *build* the road proper of the widths above indicated."*

Under the subject of road-building must necessarily be included the construction of bridges. In all cases these should be built in the most substantial manner, and the materials used should be those which have proved to be the most durable. Even in rural districts, where both stone and wood are abundant, it would often be preferable to build a bridge of the former material. The first cost would be larger, but its greater durability and exemption from repairs would render it in the end much the most economical.

Care should be taken to prevent any obstruction of the stream, by the improper position of bridges. By neglect of this precaution serious damages may be inflicted upon the neighboring lands in a low country, and in high lands the bridges themselves are liable to be swept away. Under these latter circumstances, and in other cases, the iron suspension bridge has proved the most suitable.

Not only durability, but fitness and beauty of design should be leading principles in building a bridge. It is just as economical to construct one that shall give pleasure by its elegance and symmetry as to construct one that is uncouth and out of proportion.

A roadway having been thoroughly constructed from the first, or having been improved in the best manner possible, it is necessary that it should be kept in continuous repair. And it is here that mistakes are so frequently committed. Liberal sums are expended by cities and towns in making perfect roads, and instead of keeping them up to the standard by the necessary repairs at the moment when needed, they are allowed to continue in a defective state, until large outlays are again necessitated, and the travelling public are put to much inconvenience by the unavoidable delay attendant upon operations requiring so much labor.

It is perfectly useless then to expect good roads at any time unless a complete surveillance is made continually, and any defects at

* First Prize Essay, Mass. Agricultural Report, 1869-70, p. 211.

once remedied. "The problem can be put in this way: To have a good road, it is necessary that there be no dust or mud on the same, and that there be no ruts; therefore remove the dust and mud as fast as they are formed, and fill up the ruts as fast as they are made. It may be thought, at the first view, that this is too expensive a system. Its principal beauty, however, lies in the fact that it costs less per mile of road kept one year than the pernicious system of annual or semi-annual repairs, as will be shown and proved. The above two rules — sweep off the mud and dust, as fast as they are formed, and fill up the ruts and bad places with new material as fast as they appear — are all that is necessary to be carried out in order that there be *continually* a good road. Without continual repairs, there can be no such thing as a constantly good road — a proposition that cannot too often be repeated. By repairing a road annually, or twice a year, it matters not which, the result is, strictly speaking, a *good* road at NO time during the whole year. The road is wretched just after repairs; it becomes *passable* after a while, and deteriorates from that day forward, until it is again made wretched. By the other method, is offered us a road as smooth as a floor, year in, year out; and, let it not be forgotten, at *a less expense.*"*

The following plan is that which experience has taught us as the best adapted for the continuous repair system of broken stone roads: The material for the superstructure of the road-bed, ready prepared, is placed at suitable distances along the side of the road. A requisite number of persons are employed to perform the necessary labor. This labor consists in the removal of the dust formed during the dry season, and of the mud during the wet weather; in the removal of the covering as fast as it wears away, and in the filling up of ruts and depressions with new material, at the earliest moment. By a constant oversight and attention to these points, any large ruts are prevented, and by a proper and judicious method of applying the material, the road-bed is preserved in its original integrity.†

Experiments conducted for the purpose, by German and French engineers, conclusively show that resistance to draught is four times as great with deep ruts and thick mud on foundation roads; and that a dusty or muddy condition of otherwise good roads, adds

*First Prize Essay, Massachusetts Agricultural Report, 1869-70, p. 233. †Ibid, pp. 236-238.

very materially to the draught. In order to lessen the wear of the road during the dry season, the surface must be sprinkled; an operation which confers a blessing upon both man and beast at the same time.*

"Bowles, in his book, 'Our New West,' mentions the case of the stage road from Sacramento to Virginia City, *via* Placerville, one hundred and fifty miles long, and having an annual traffic of seven or eight thousand heavy teams, and whose proprietors found that the simplest and cheapest way of keeping it in repair during dry weather was to sprinkle the whole of it—one hundred and fifty miles of mountain road."†

We have now given what may be considered as the standard in road building, and we have stated how that standard can best be maintained. It would seem superfluous for us to say, that as a people, we fall very far below that standard. No one who has the least occasion to travel on our ill-constructed roads can fail to be aware of their imperfect condition during a greater portion of the year, a condition which could only be excused in the most thinly inhabited mountainous or sandy districts. Strange as it may appear, even our immediate community is not yet educated up to a full knowledge of the value of good highways, although a gradual advance in the right direction is perceptible.

Large sums of money are annually expended upon our roads, which may be said to be actually lost for want of proper and constant superintendence. Not only are many of them improperly built at the outset, but when repairs are made these are performed in such an imperfect manner, with such poor material, and often in the dry season, that travel over them is rendered more difficult than ever, while the first heavy rainfall is too apt to wash away all traces of the attempts at renovation.

One of the causes of our deficiencies in these matters may doubtless be attributed to a system long pursued in this state, which, however well it may have been adapted to the colonial period, is no longer applicable at the present day. We refer to a law of this commonwealth, which requires towns to raise annually a certain amount of money to be appropriated to the making and repairing of roads, to divide the town into districts, and to appoint a surveyor over each district, who shall see that the money is

*See First Prize Essay, Massachusetts Agricultural Report, 1869-70, pp. 242, 243.
†Ibid, p. 237.

properly expended. To every inhabitant is offered the privilege of working out his proportion of taxes at a price stipulated by the town. There would be no serious objection to this system, if all were alike interested in having good roads, but as circumstances are, it is too apt to result in a holiday's amusement, under the supervision of a man who has been chosen rather for his popularity, than for any knowledge that he may have of building roads.

"The time the surveyor chooses is generally when he has the most leisure, and whether required or not, he frequently works out his money at once, and gets done with it. The work is often performed in the rudest manner, and the road is coated here and there with thick patches of worthless stuff—better suited for top-dressing for crops than for road material—to be washed into the gutters on the occurrence of the first heavy rain. From want of judgment, or want of interest, the money is wasted, and the people are burdened with the heavier tax of struggling over hard roads, made worse by the money they have paid for improving them. Less frequently a man is chosen who understands better what is needful to be done, and with what means he has, he commences some improvements, which, if followed up in after years, would result in a public benefit; but his office is only for a year, and he may be followed by a man who will undo what was well begun."*

An improvement on this system has been adopted by many of our cities and larger towns, and consists in the appointment of a superintendent, with an efficient corps of workmen under him, who has authority to make the purchase of all necessary machinery and paraphernalia, and who has complete supervision of roads and bridges. Even in the smaller towns much might be effected under a modification of the present system. Thus, let laborers be employed, under the supervision of one overseer, appointed by the town, who, in the various districts, shall keep the roads of that district in *constant* repair, filling up all ruts and holes as soon as formed; using only the best materials to be obtained, and these in a thorough and workmanlike manner. Let all new roads be constructed with especial reference to complete under-drainage, and let all culverts, drains, and ditches be kept open; let the surface of every road be kept smooth and free from loose stones, and in dry weather, wherever practicable, well sprinkled. Such a plan, of course, necessitates constant labor, but it will be found to be the

*Third Prize Essay, Massachusetts Agricultural Report, 1869–70, p. 304.

most economical, and by far the most satisfactory to every traveller, as well as tax-payer, in the community.

But we cannot hope for a general and radical improvement in the condition of our highways, until the laws respecting the same are amended. There must be a uniform system of management throughout the commonwealth, and this might be effected by the adoption of a plan similar to the following, of which we give a mere outline:

First, there should be created a state department of roads and bridges, at the head of which should be a practical civil engineer, thoroughly educated, and entirely conversant with that construction and management of roads which experience has taught older nations to be in every way the best. Next, the state should be divided into districts, to each of which should be appointed a supervisor, who should be responsible to the chief for the proper management of affairs within his limits. The roads throughout the state would thus receive uniform attention, and every town would gain the benefit to be derived from the most improved and costly machinery, which is now limited to a few of the largest that can afford to purchase it, while the best material could be used wherever found, without regard to boundaries of towns.

Wood, iron, stone, and asphalt, are materials which are also used for road surfaces, but as they are better adapted to the paving of city streets, we shall have no occasion to discuss their relative value in these pages.

Modern improvement demands that all suburban roads, and those of thickly populated districts in the country, should be provided with sidewalks or foot-paths, and that they should be well lighted. The sidewalks, in all cases, should be constructed with reference to proper drainage, and the materials used should be those which are found to be the most suitable and easily obtained in the immediate neighborhood. In suburban districts bricks or stone flagging may be found the most durable, and therefore the most economical. Asphalt has seemed, thus far, to answer a good purpose, and possesses some advantages. But the sidewalk or foot-path, which is most applicable to our country roads, is constructed of small stones as a foundation, with gravel as surface, and rolled hard and very smooth. Of whatever material they are made, they should be considered as a necessary adjunct to the road-bed, and kept in continuous repair.

Either gas or oils of various kinds, are the articles best adapted to lighting roads; and they should be provided for this purpose in every suburban district, and in every populous village. In fact, well lighted roads are absolutely essential to every community, not only as means of comfort and convenience, but also as a protection against "the evils that walk in darkness."

Public highways of the best possible construction having been provided, it then becomes a cultivated people to ornament them. This is most fitly and usefully accomplished, by the introduction of trees along their borders. If any one doubts the truth of such an assertion, they have only to visit some of the older towns in our commonwealth, more especially in the western portions, and along the valley of the Connecticut, where they cannot fail to admire the magnificent elms and sugar maples that adorn the road-sides, which the foresight of a former generation has provided for our gratification, and the presence of which gives a certain character to those towns, which nothing else can supply.

A proper selection of trees most suitable for the purpose must be made, and as a general rule, those should be chosen which are indigenous to the particular district. Experience has shown that the American elm and the sugar maple are more universally adapted to road-side planting than any others. To these we may add other species of maple, certain kinds of oak, the ash, hickory, and English elm. Care must be taken that the trees are not planted too thickly, or in such a way as to overshadow the road to the entire exclusion of sun and light, for although such a condition may be agreeable to the passing traveller and his beasts, it is apt to create a degree of moisture which is not conducive to the preservation of the road-bed surface.

Evergreens are in no way suitable for road-side planting, and should never be allowed to occupy a position by which the sun is excluded, and whereby ice and snow are retained in the spring months, long after their disappearance in other places, rendering the travel difficult and dangerous.

There are many roads, which may be truly called "country roads" in contradistinction to the suburban, and the great thoroughfares of the larger towns, which need no ornamentation beyond that which Nature herself has amply provided in the trees and hedges which have sprung up spontaneously along their borders. The very seclusion afforded by this natural embellishment, consti-

tutes their great charm and source of attraction, and should not unnecessarily be interfered with. If the money which is now annually spent by many towns, in assiduously destroying all these charms of our by-ways, by cutting down and uprooting the various shrubs, vines, bushes, and young trees, which serve as breeding places, and afford food to our insectivorous birds, as well as hide the unsightly piles of stones, rubbish, and dilapidated walls — were expended upon the improvement of the road-beds, it would add greatly to the comfort and safety of the traveller. When any substantial reason exists for this extermination of all natural beauty, it is desirable to submit; but as it is often done without any definite object in view, and merely because it is a custom, we suggest that the pleasure afforded by its presence more than compensates for any possible impediment or injury to the road itself.

A true observer* of natural objects thus pleasantly discourses on this subject: — "The beauty of these old roads does not consist in their crookedness, though it cannot be denied that this quality prevents their being tiresome, and adds variety to our prospect, by constantly changing our position. Neither does their beauty consist in their narrowness, though it will be admitted that this quality contributes to their pleasantness by bringing their bushy sidewalks nearer together. Their principal charm consists in the character of their road sides, now overgrown with all that blended variety of herbs and shrubbery which we encounter in a wild pasture. We hear a great deal of complaint of these old roads, because they are crooked and narrow, and because our ancestors did not plant them with trees. But trees have grown up spontaneously in many places, sometimes forming knolls and coppices of inimitable beauty; and often an irregular row of trees and shrubs of different species adds a pleasing variety to the scenes. And how much more delightful is a ride or a stroll through one of these old roads, than through the most highly ornamented suburbs of our cities, with their streets of more convenient width. The very neglect to which they have been left, on account of the small amount of travelling over them, has caused numberless beauties to spring up in their borders.

Let us, therefore, carefully preserve these ancient winding roads, with all their primitive eccentricities. Let no modern vandalism, misnamed public economy, deprive the traveller of their pleasant advantages, by stopping up their beautiful curves, and building

* Wilson Flagg, Studies in the Field and Forest, p. 53.

shorter cuts for economizing distance. How much indeed, would be done for us by Nature, if we did not in conformity with certain notions of improvement, constantly check her spontaneous efforts to cover the land with beauty."

In this connection we would remark that it seems hardly consistent for town authorities, by the offer of prizes or by other means, to induce the inhabitants to set out trees for the ornamentation of the highways, and at the same time to allow these officers on their own responsibility to cut down the magnificent growths of centuries, in order to widen a road unnecessarily, or to straighten a line without sufficient cause. We have known this sacriligious act, as it might well be termed, to be committed without the slightest necessity, and where it would seem that the very exertions made by interested individuals to preserve, only excited the spirit to destroy.

The introduction of water into many of our suburban and country towns, as well as the existence of brooks and springs, renders easy the introduction of fountains and drinking troughs along the road borders. These may be of the most simple construction, as befits the more rural districts, or they may be of stone or iron, more or less ornamented, according to their position and surroundings. The provision and maintenance of these should be compulsory as a public necessity, and they should be placed upon much travelled roads at distances of not more than five miles apart, and at correspondingly shorter distances in thickly settled regions.

There is a practical point which should be kept in mind as regards watering troughs, and which, if adopted, may prevent the occurrence of serious accidents. It is that the supply pipe should be inserted into the bottom of the trough, and not rise much above the surface of the water, when the trough is filled; if it does, and the water is blown about, ice is formed during the winter season, rendering the approach to the trough difficult and dangerous. The overflow should also, in all cases, be conducted in a pipe to a proper drain.

Walls, fences, hedges, and other modes of enclosing property abutting upon the highways are still necessary for protection against intrusion, and as means of seclusion, especially in suburban towns. These may be considered as entering very largely into the ornamentation of our roads, especially when constructed or kept with due regard to refined taste and good judgment. Where such a neces-

sary variety of opinion exists on a subject, no special uniform plan could be adopted, nor would this be desirable. In certain localities, and under certain circumstances, the entire absence of all artificial boundaries might contribute to the embellishment of the public ways by the air of refinement and elegance thus produced.

The borders of all roads, especially in the neighborhood of large towns and villages, should be kept with neatness and with some regard to æsthetic principles. There seems to be an almost entire want of attention to these matters in most of our communities. We not unfrequently see large and small estates maintained with great care and even elegance, within their immediate limits, whilst the roadsides which bound them are neglected and allowed to become the receptacle for filth and rubbish. Every proprietor should take an interest in the public welfare, so far certainly as concerns the neatness and general appearance of the highway bordering upon his estate. And this resolves itself into the adoption of very humble measures, being nothing more than a nicely kept greensward, a healthy condition of hedges, trees, and shrubs; the perfect order of fences and walls, and the absence of everything that may offend the sight.

Mr. Mitchell, in his charming book, "My Farm of Edgewood," in speaking of the æsthetics of the farmer's business says: "Here and there we come upon a certain neatness and order in enclosures, buildings, and fields, but ten to one the keeping of the picture is absolutely ruined by the slatternly condition of the highway, to which, though it pass within ten feet of his door, the farmer by a strange inconsequence, pays no manner of heed. He makes it the receptacle of all waste material, and foists upon the public the offal which he will not tolerate within the limits of his enclosure. And the highway purveyors are mostly as brutally unobservant of neatness as the farmer himself; nay, they seem to put an officious pride into the unseemliness and rawness of their work, and it is only by most persistent watchfulness that I have been able to prevent some bullet-headed road-mender from digging into the turf-slopes at my very door."

In our remarks, we have had our own commonwealth more especially in view. If she, in her general superiority, is so lamentably deficient in the condition of her highways, what can be said of the other older states. We will leave those to answer who can do so from their own experience, merely premising that we are not at all

surprised when reports like the following from the southern states are received by the Department of Agriculture in answer to inquiries.*

From Florida. "No road laws, no bridges; streams are crossed by ferries, fording, or swimming."

From Texas. "Our roads are not worked, the wagoner making his own way. Soil remarkably favorable for roads. No macadamizing material in the state, none needed. Road laws in this magnificent state, like other laws, seldom executed. No turnpikes; don't need them. Roads last until they become too miry, when wagoners cut a new one. Texas can boast of the best roads, with the least work, of any state in or out of the Union. Our citizens generally regard work as *unconstitutional*."

Finally, as we have already remarked, if we desire an improvement in the condition of our suburban and country roads, we must have a uniform system, by which to work, throughout the state, and in order to effect this, there must be a revision of the laws upon the subject. Let Massachusetts lead in such a needful reform, and other states, seeing the advantages, will quickly follow her footsteps.

Discussion.

C. M. Hovey expressed himself as much pleased with the essay, and hoped it would lead to better results than we have at present. The roads in England are unsurpassed; they are all macadamized, and are kept in order by sweeping off the dust and scraping up the mud as soon as they collect. As Dr. Slade has said, the superintendents of repairs here are seldom men possessing any special or practical knowledge of the subject. Mr. Hovey alluded to the roads in Cambridge, where the superintendent was formerly a lumber manufacturer.

Mr. Strong said that we think the roads of Massachusetts pretty good, and gentlemen from the West and South think them very good; but he hoped we should do what we could to promote a feeling of dissatisfaction with our roads, for he agreed with Mr. Hovey that they are far inferior to those of foreign countries, and that the superintendents are often utterly unfit for the service. As he drove into town to-day his horse was so frightened by a heap of ashes at the roadside that he was almost prevented from being present at the meeting.

* Report of the U. S. Commissioner of Agriculture, for 1868, p. 348.

Marshall P. Wilder was glad to know that this subject had been introduced. The only way to effect improvement in our roads is to enlighten public sentiment. The subject has been very thoroughly discussed in the meetings of the State Board of Agriculture. Forty-five years ago, when he first went to Dorchester, the roads from his house to the church were at times almost impassable in the breaking up of winter. Now they are as good as a street in Paris, and the improvement has been effected by a liberal expenditure of money, on the principle of securing thorough drainage and stone surfaces.

John B. Moore said that the subject had been fully discussed by the Board of Agriculture, and as a result a law was passed by the Legislature authorizing towns to appoint Road Commissioners. The course authorized had been largely adopted, and had been followed by much improvement. But there were great difficulties in the way, some towns of not more than fifteen hundred or two thousand inhabitants having within their limits two hundred or more miles of road. Such is the case with the town of Chelmsford. An appropriation of fifteen hundred dollars is as much as such towns can afford, and it must be spread out pretty thin to cover two or three hundred miles of road. This difficulty might be obviated by state aid to such towns, but it would be better for a farmer to give away his farm than to pay the taxes necessary to keep such a length of road in a high state of excellence.

The thanks of the Society were unanimously voted to Dr. Slade for his essay. The Chairman of the Committee on Discussion stated that it was the intention of the committee to reserve some Saturday for further discussion of the subject.

MEETING FOR DISCUSSION.

SATURDAY, February 10, 1877.

W. C. Strong, Chairmain of the Committee on Discussion, presiding. The Chairman called on C. M. Atkinson for information concerning a new *Bougainvillea*, exhibited by Mr. Nelson, gardener to Hon. Robert C. Winthrop. Mr. Atkinson said that the species

was received for *glabra*, but was of a different color, and he thought it *lateritia*. It was of very striking and attractive appearance; of brick red or vermilion color and not so gross a grower as *B. spectabilis*.

Lecture on Entomology.

The Chairman then introduced B. Pickman Mann, who spoke on Entomology, in substance as follows: —

The interest of the horticulturist in insects is in their relation to plants, but entomology cannot be successfully studied in this economic aspect without a knowledge of technical entomology. If a person finds his apple trees eaten by an insect, he may not recognize it until it is too late to prevent the injury. If he applies to a neighbor for information, it may prove to be the canker worm, tent caterpillar, palmer worm or some other insect. If it is a canker worm he must provide against two kinds which have very different habits, — the fall and spring canker worms. The former comes out of the ground in the autumn, and continues to ascend the trees until April, excepting from the middle of January to the end of February, crawling on the trees and laying its eggs in patches on the bark. The other does not make its appearance until spring, and can be distinguished by the possession of a long tube, by means of which it lays its eggs in crevices, etc. If the insect proves to be the tent caterpillar (*Clisiocampa*), the cultivator must know the proper season to attack it. Frequently the best time to attack insects is when they can only be discovered by search. The chrysalis of the cabbage butterfly is readily accessible, and is attacked by a little wasp, so that in destroying the chrysalis we may destroy many of our friends, as may be proved by collecting a quantity of the chrysalides and placing them in a wire cage, when it will be found that a large proportion will produce no butterflies, but there will issue from them many of the little wasps which have been the cause of their destruction. These considerations show the importance of such an exact knowledge of insects as can only be acquired by a special student.

Of 200,000 known species of insects we have 30,000 in this country, and of this number, not a large proportion, — only about 2,000 species, — are so injurious as to be of importance. Some knowledge of insects can be obtained empirically or by tradition, but it is often misapplied; the means which have proved effectual in

destroying one insect are used for an entirely different one, or the remedy is applied too early or too late, creating distrust of entomological knowledge. At times insects appear in great numbers which have never appeared before. Most of our destructive insects are imported from Europe, and have driven out the native kinds, as foreign weeds have superseded the indigenous. American insects are of a more ancient and less improved type than the European, and can no more cope with civilized European insects than the red man can cope with the white man.

Mr. Mann reviewed a recent publication upon the subject of his lecture, to show that neither experience in horticulture nor in any other walk of life, would avail for the protection of plants from injury by insects, unless a knowledge was gained of the insects themselves, and that any number of isolated observations, however accurate in themselves, might lead, as in the case mentioned they had led, to the most erroneous conclusions, unless that thread of interpretation was seized upon, which could only be grasped with certainty by persons who had made the insects themselves objects of study.

He then gave an account of the principal insects known to be injurious to currant bushes in this part of the country, pointing out their differences in appearance and in habit, and the different measures necessary to adopt in order to prevent or diminish the injury caused by them.

1. The tender tips of the currant bushes are cut off squarely in the night by the caterpillar of a moth known as *Hadena arctica*, a description of which may be found in Dr. Harris' "Treatise on Insects Injurious to Vegetation," edition of 1862, p. 450. This caterpillar is not known to cause any other injury to the currant bush.

2, 3. The caterpillars of two insects, one a moth, *Ægeria tipuliformis*, and the other a beetle, *Psenocerus supernotatus*, consume the core of the stems, weakening the plant both in its power of work and in its power of resisting breakage, or quite killing it. These insects are best attacked by breaking off in winter the stems containing the chrysalis and burning them.

4, 5. The caterpillars of two other insects, one a moth, *Ellopia ribearia*, and the other a saw-fly, *Nematus ventricosus*, consume the leaves of the plant, thus checking or destroying the growth of the fruit and eventually that of the whole plant. The former of

these two is a measuring worm, which lays its eggs upon the stem and branches of the bush, where they remain all winter and may be found and destroyed. Bushes from the nursery should be examined so that the insect may not be introduced into places now exempt. The latter is of European origin and has of late been so destructive as to be known as *the* currant worm. The perfect insect comes out of the ground in May, and finds the leaves ready; it lays about a hundred eggs on the under side along the principal veins, where they can be seen by turning up the leaves, which should be plucked off and burned. This is the easiest method of destroying this insect. If the eggs are allowed to hatch, the worms immediately begin eating the leaves, at first making little holes, which they soon enlarge, afterwards eating the edges, and then going to other leaves. The worms should be gathered and crushed or thrown into boiling water. When they have finished eating they go into the ground and form a cocoon near the surface, or under leaves. If the ground is smooth and hard under the bushes, or if boards are laid over it they are, in a measure, prevented from doing this. There are two broods in a year, the second being much more numerous than the first. The earlier they are attacked the better. These details will serve as a specimen of the treatment which injurious insects ought to receive.

These five are the most important enemies of our currant and gooseberry bushes, but a large number of others are known, which do, at times, very severe harm to the same bushes.

A repetition of the descriptions of these insects, would only add to the large number of times the same have been described. Experience has shown that little attention is, as indeed from the nature of the case must be, paid by practical horticulturists to accounts of the habits and descriptions of the forms of these insects, for while the description itself might be simple, the interpretation of it requires some knowledge of the several tens of thousands of other insects found also in this country. By way of illustration, Mr. Mann drew a parallel between the practice of economic entomology as a profession, and the practice of medicine. While every person might be competent to study the nature of any one disease, and to administer the proper remedies, the very great number of diseases and the necessity of immediate readiness to cope with any one, made it only possible for persons who devoted their whole attention to the subject to undertake the task of practising medicine. So it is

with the entomologist. It will not be until the horticulturist or the farmer calls in an entomologist to prescribe for insect ravages, that these can be reduced within reasonable limits. Every one will admit, when the ravages are in progress, that a remedy for each kind of injury alone would be of immense value, but few can command the means of being at the same time cultivators of plants and proficient students of the insects which are injurious. Moreover, much of the greatest protection afforded to plants comes by the agency of insects, whose labors must be understood and appreciated before they can be secure against destruction.

Mr. Mann called attention to the action of several of the states in the Mississippi valley, especially the state of Missouri, which has maintained a State Entomologist at a salary of two thousand dollars a year for nine years. The labors of this entomologist have been recognized as of very great value, and have brought to him, among other tokens of esteem, the gift of a gold medal from the government of France. Illinois and Tennessee, as well as other states, have maintained State Entomologists, and the State Agricultural Society of New York, has declared that the labors of the entomologist employed by it have been worth fifty thousand dollars a year to that state.

Mr. Mann expressed the opinion that the services of a State Entomologist would be of equal value to our own commonwealth. The state of Massachusetts has received the benefit of the labors of Dr. Packard, of Salem, for several years, but in such a way that Dr. Packard has been obliged to bear part of the expense of the publication of his reports in the "Report of the Secretary of the State Board of Agriculture," while receiving no pay for his labor. Mr. Mann thought it of the utmost importance for the horticulturists of this state to secure a recognition of their claims, and that addresses upon entomology were of little avail towards the diminution of the ravages of insects in any other way than by arousing the people to a realization of their rights and their best interests.

Discussion.

The Chairman said that none of us realize the great injury from insects, which is increasing rather than diminishing, as the Colorado beetle and other new insects make their appearance. He regretted that we should be so far behind Missouri and other states, in our measures to attain to and disseminate a knowledge of injurious in-

sects, and thought it desirable that the Society should be represented on the State Board of Agriculture, where it might assist in procuring the appointment of a State Entomologist.

C. M. Hovey agreed with the Chairman that the Society ought to be represented on the Board of Agriculture, but said that it should be remembered to the credit of our state that it was the first to move on this subject, by the appointment of Dr. Harris to make a report on the injurious insects of Massachusetts, which has served as the foundation of the reports of other states. Mr. Hovey spoke of the difference between European and American insects, and said that the phylloxera does not seem to be very injurious to our American vines.

N. B. White said that he had destroyed large numbers of the cut-worm moth, by placing a light in a tub of water mixed with oil, about the last of May or first of June. He counted what were caught in one night, up to five hundred, which was not a quarter part of the whole.

Mr. Mann, in reply to an inquiry as to the scientific name of the cut-worm, said that one of the most common kinds is *Hadena devastator*. Another common species is *H. clandestina*. In Riley's first (Missouri) Report on Insects, twelve important distinct kinds, that hatch into moths, are described, and several are figured. The remedy adopted by Mr. White is one of the best. The speaker had not been aware of any cut-worm whose caterpillar is a moth, attacking grass. The army-worm cuts off grass above the surface.

C. M. Hovey remarked that the cut-worm attacks young seedlings, seriously injuring whole fields when just springing up.

Mr. Mann said that Mr. White was correct as to the best time for destroying the common cut-worm moth, but that there were twelve hundred moths of this family, and a hundred of the genus mentioned, and that other species than the one mentioned appear at different seasons. In July and August there are few perfect insects. Observations on the time when insects appear are important, and it is desirable that when any insect not before observed makes its appearance, specimens should be sent in quantity to entomologists. Specimens of any insect not known or recognized are also desirable.

The number of first-class original observers in this branch of natural history in this country, is very small, and all the results of their observation are contained in a small compass. Dr. Harris is

unsurpassed in his power of presenting the subject familiarly, but the greater part of the most valuable details about our own insects have been discovered since his time, through the impulse he gave to the study. Nothing of economic importance was added to the later editions. His book, with Dr. Fitch's New York Reports, * Riley's Missouri Reports; the * Illinois Entomological Reports, by Walsh, and afterwards by Le Baron; Walsh's papers in the Proceedings of the Entomological Society of Philadelphia, and in the *American Entomologist in connection with Mr. Riley, and the * Practical Entomologist, are the most desirable works on the subject for horticulturists, and those marked with a star may all be purchased for twenty dollars. Much important detail may be found in other works.

The spring brood of currant worms is apt to be divided into two parts, one appearing earlier than the other. This is the case with many insects, and frequently a third portion will remain over until another season. This is apparently a provision of nature to secure the continuation of the race.

P. B. Hovey thought the currant borer more difficult to contend with than the currant worm. We might be obliged to cut the bush all away, and a single borer may destroy a plant when grown in tree form.

Mr. Mann said that if the currant borer had gone down to the bottom, the stem was destroyed and might as well be cut off. There is no way of destroying it in the moth form, as it is then small and inconspicuous.

Sweet substances are more available than light to attract insects. Poor molasses and ale, mixed and smeared on the bark of trees or on rough boards, is excellent for this purpose. Townsend Glover, the entomologist of the United States Department of Agriculture, has devised a trap for catching insects, consisting of a box with converging sides and conical entrances, and a light in the centre.

C. M. Hovey suggested that the currant borer might be provided by nature to take away old currant stems and cause the growth of new. The tree form is unnatural for the currant.

P. B. Hovey said that currants bear best on wood three or four years old, and do not form spurs until the second year. He thought that the best fruit was produced on trees, but when the stem is perforated by the borer it becomes so weak as to break, or at least the quality of the fruit is deteriorated.

James Cruickshanks agreed with C. M. Hovey that we must rely on suckers to renew the bush. Old wood bears poor fruit. He had a plantation in tree form, where every bush was killed by the borer before they were three or four years old, and he could find no remedy.

C. M. Atkinson remarked that in Europe currants are always grown on single stems. He had been troubled with a black beetle on his potatoes, which moved by hopping, and bored holes in the leaf. They swept away the whole of one piece of potatoes. He had driven them away by sowing coal ashes over them. He had found a handful of coal ashes, dropped on the spot where a cabbage plant was to be set out, a preventive of club foot and cut-worms.

H. W. Fuller spoke of the grub of the cockchafer or May beetle, which is so destructive to the roots of grass, and whose ravages he had observed on the lawns at Woodlawn Cemetery and at Alvin Adams' estate in Watertown. The history of its life is very curious; the beetle deposits an egg in the ground, from which a soft, white grub is hatched which grows for three years, and cuts off all the fine fibrous roots of the grass so that the sod can be lifted from the earth like a carpet. The third or fourth year it goes down eighteen inches into the ground, and comes out a light colored beetle, which soon grows darker and flies away to repeat its operations. He had found them by hundreds under the turf on the edge of the dead spot in the grass. They are distinct from a similar worm, much resembling them, found in manure heaps. He spread a liberal supply of nitrate of soda on the lawn with good effect, as he thought, the lawn during the next summer not being much troubled by them. He regarded potash, or any good alkali, as the most practical remedy in the case.

Mr. Atkinson said that year before last he applied what coal ashes he had on hand to his lawns, and rolled with a heavy roller, with good effect in destroying these grubs. He thought it more due to the ashes than to the roller.

Mr. Mann said that the use of the roller was one of the most approved ways of destroying these insects; he thought it more effectual in this case than the ashes. Mr. Fuller was right in regard to the larva of the dor-bug growing three years in the ground, but they are not destructive the first year. Dor-bugs are very abundant in some years, and not in others, and in any given case it would be the same three years later.

P. B. Hovey said that Dr. Lodge sent his men out with lanterns in the evening and found these beetles on the under sides of the leaves on the apple trees; he collected a bushel of them.

Mr. Mann said that the beetle of the muck worm, which so much resembles the grub of the dor-bug, was black with the wing covers ridged. The goldsmith beetle clings to the under side of leaves during the day. He did not understand what Mr. Atkinson meant by the black beetle. He spoke of a blistering beetle, a flat beetle, a flea beetle, two millimetres in length, and others, but thought those mentioned by Mr. Atkinson must have been some other species. Many observations had been made on flea beetles, particularly those infesting turnips, and he could give information how to destroy them.

Marshall P. Wilder quoted the statement made by Professor Chadbourne, of Williams College, that the potato beetle could be destroyed at an expense of not more than five dollars per acre. This might be done by planting very early kinds, before the beetles became numerous. The beetles are to be picked off by hand and destroyed, and thus the later crop of potatoes will be less liable to injury. If this is neglected, and the second crop of beetles is allowed to appear, poison must be used, but this will cost more than hand picking early in the season, and poisonous drugs destroy beneficial as well as injurious insects. Mr. Wilder knew of an instance of successful hand-picking in New Hampshire.

Mr. White said that he had seen the potato beetle in Minnesota, and Professor Chadbourne's plan would not succeed when the insects were as numerous as they were there. We have not yet had the potato beetle here in full force, as it has come in the West.

The Chairman remarked on the necessity of concerted action in the matter, for our fences are not strong enough to keep out the beetles coming from our neighbor's grounds.

MEETING FOR DISCUSSION.

SATURDAY, February 17, 1877.

The Chairman of the Committee on Publication and Discussion presided, and before taking up the subject assigned for the day, called for remarks on any of the objects exhibited, especially the

forced lilacs shown by C. M. Atkinson. These were of two varieties, the Persian and Charles X, and were of the natural color.

James O'Brien said that he had forced lilacs this winter, of the natural color, and had found a good demand for the flowers. He prepared his plants by growing them in pots, and thought that if planted in the ground there would be a tendency to make too much wood.

Mr. Atkinson said that he had never attempted to blanch the flowers. He received five or six years ago, from Waterer & Godfrey, twelve Persian lilacs, one or two of which were of a lighter color than the others, and last year a majority of the twelve were white. Mr. Waterer was much surprised when told of it, as he had never heard of a white Persian lilac. They were not, however, pure white. Of the four specimens shown, the Charles X were grafted on the common lilac, while the Persian were on their own roots. Mr. Atkinson described an interesting and successful experiment in blooming lilacs in winter by cutting shoots with flower buds and placing the butts in hot water.

Charles M. Hovey said that his views in regard to the varieties of the Persian lilac were the same as Mr. Atkinson's — there is a pale, but not white, one, which when grown under a high temperature proves quite white. Mr. Hovey referred to the plants shown by Mr. Calder last year, which were probably the old variety, and to his own remarks on temperature and time in forcing (TRANSACTIONS for 1876, Part I, pp. 43–49). Light and air are necessary to bring out the natural color. The Persian has more compact panicles and is less gross in habit than the old kind, and therefore better adapted for forcing.

The Chairman here introduced the subject assigned for the day, viz., Fertilization and Cross-Fertilization. He felt much interest in the opinion of Prof. Goodale that nature abhors individuality. Prof. Goodale also stated that cross-fertilization in plants is the rule, and self-fertilization the exception. The Chairman was surprised that this ground was stated so strongly, and thought these views conflicted with the doctrine of evolution, as presented by Darwin. But the subject is full of practical interest to us as horticulturists, especially in the cultivation of those plants whose seed or fruit we desire to ripen. We want to know whether we must introduce insects into our greenhouses to fertilize our grapes or strawberries.

Mr. Hovey said that the subject presented by Prof. Goodale required much thought. In his view the ideas of the gentleman who had taken this strong ground in regard to the infrequency of self-fertilization were beginning to loosen a little. He could not subscribe to the doctrine of evolution, and thought that it was only by self-fertilization that nature keeps itself true. The clover of to-day is the same as the clover of a thousand years ago. So also with timothy grass, and many other plants: they are all unchanged. With all the good that Mr. Darwin has done, his writings have been to some extent sensational. It needs much time and many experiments to establish the views presented in the lecture under discussion. Mr. Hovey thought self-fertilization the rule and cross-fertilization the exception.

Mrs. J. W. Wolcott inquired whether Mr. Hovey was certain that clover had remained unchanged for a thousand years, and that the flowers were self-fertilized.

Mr. Hovey replied that if the red and white clovers had been crossed this would have produced a hybrid. We know that a pistillate strawberry is sure to be fertilized if there is a staminate within reasonable distance, and he presumed the clover might be cross-fertilized.

Benjamin P. Ware thought the corn crop a fair illustration of the point under discussion. Farmers know that a perfect ear seldom grows on an isolated plant, showing that it is dependent on cross-fertilization. It is fair to presume that in like manner each head of clover may be fertilized from its neighbor.

John Robinson read from a notice in the "American Cultivator," of Darwin's new work, "Cross and Self-Fertilization of Plants," an account of some interesting experiments with Indian corn, to test the comparative vigor of cross and self-fertilized plants. These were planted in two rows, and "when fully grown the ten tallest plants in each row were selected and measured to the tips of their highest leaves, as well as to the summits of their male flowers. The crossed averaged to the tips of their leaves 54 inches in height, and the self-fertilized 44.65 inches, or as 100 to 83; and to the summits of their male flowers 53.96 and 43.45 inches, or as 100 to 80." The aggregate height of fifteen cross-fertilized plants raised in pots was 302.88 inches, and of fifteen self-fertilized plants, on opposite sides of the same pots, 263.63 inches. The practical points deduced by the editor of the "Cultivator" from these and other experiments by

Mr. Darwin, and which Prof. Robinson thought excellent, were as follows: "We here see how gardeners can improve their plants by sowing mixed seeds of a variety, a result easily attained by purchasing peas, beans, or other seeds, from three or four seedsmen whose seeds of the same variety were produced in different localities, instead of purchasing all of any given variety of one seedsman. This may cause a little more trouble, but, as Darwin, Gower, and Lecoq have demonstrated, the results thus attainable are worthy of extra care in culture. By all seed-growers, for trade purposes, this book of Darwin's should be specially studied, and to them we most cordially recommend it."

Prof. Robinson thought it an outrage to apply the term "sensational" as Mr. Hovey had done, to the writings of such a man as Mr. Darwin, who was acknowledged by every one to be a most accurate observer and a careful and thorough experimenter. Mr. Hovey thinks cross-fertilization the exception and self-fertilization the rule. Others differ from him, and when we see plants arranged like the orchids and willows, where self-fertilization is rendered impossible, we cannot think it strange that they should differ. Prof. Robinson here read from a review of Mr. Darwin's book, in the "American Journal of Science and Art," by Prof. Asa Gray — "That cross-fertilization is largely but not exclusively aimed at in the vegetable kingdom, is abundantly evident. As Mr. Darwin declares, 'it is as unmistakably plain that innumerable flowers are adapted for cross-fertilization, as that the teeth and talons of a carnivorous animal are adapted for catching prey, or that the plumes, wings, and hooks of a seed are adapted for its dissemination.' That the crossing is beneficial, and consequently the want of it injurious, is a teleological inference from the prevalence of the arrangements which promote or secure it — an influence the value of which increases with the number, the variety, and the effectiveness of the arrangements for which no other explanation is forthcoming. That the good consisted in a re-invigoration of progeny, or the evil of close-breeding in a deterioration of vigor, was the suggestion first made (so far as we know), or first made prominent by Knight, from whom Darwin adopted it." Many persons, prominent among them Thomas Meehan, are continually bringing up instances to show that plants are close-fertilized. This is not denied by any scientific man of any repute. In the words of Prof. Goodale, "What is claimed, and what is in perfect consonance with such statements is

this, namely, most plants can be in some way cross-fertilized, and this cross-fertilization, *even in those species which can be close-fertilized*, ensures greater vigor in the progeny."

Prof. Robinson remarked that Mr. Darwin's conclusions were derived from actual experiments, with hundreds of plants, those with some species extending over a period of eleven years. Prof. Goodale mentioned only a very few of the many instances that might be given, of arrangements for preventing self-fertilization.

Mr. Hovey remarked that the bean, so long cultivated and not easily self-fertilized, had never become mixed.

Mr. Ware corroborated this remark. He had never found hybrids among beans.

The Chairman mentioned the squash family as plants which mix easily.

Mr. Ware again alluded to the fertilization of corn, which he thought peculiarly interesting. To illustrate further than before, he mentioned a farmer who had a very superior variety of corn, which his neighbors desired to obtain, but which he refused to part with. To keep it pure he planted it away from all his other corn, but, unfortunately for himself, he planted some on the bank of a river, and a neighbor planted some corn on the opposite side, which was fertilized by the superior variety, and thus seed possessing most of its characteristics was obtained. Mr. Ware also knew a farmer who was famous for his excellent crop of corn, and who would go to any one who had superior corn and get a few ears, which he would plant with his other corn, regardless of the appearance produced by the intermixture; but although the crop would not present a uniform appearance, Mr. Ware thought it a question whether the mixing did not add to the vigor of the plants.

Prof. Robinson remarked that cross-fertilization does not always cause variation. He illustrated Prof. Goodale's views as to the influence of cross-fertilization in suppressing vagaries, by supposing, in a case where seeds of a plant A, produced progeny A, B, and C, that A should exactly resemble the parent, B varying in one direction, and C in the opposite. Should these be self-fertilized they would tend to form three quite marked varieties, whereas should they cross, each with the others, the variation would be broken up, and the third generation would tend to go back to the original, A, especially should B cross with C, the average being A. We find where a race mixes with other races, like the English nation, that

the result is nearer the average type than in an isolated race like the people of Patagonia. The cross-fertilization of clover adds strength to the plants, and that clover is cross-fertilized is probable from the number of bees visiting it.

The Chairman asked if these views did not conflict with the doctrine of evolution; to which Prof. Robinson replied that the tendency to maintain the average did not show that there could not be improvement.

Leander Wetherell remarked that the proboscis of the honey bee is not long enough to reach the nectar in red clover; and, consequently, if bees assist in fertilizing this plant, they must be humble bees. The first crop from a field of clover is always inferior for seed to the second, and this has been attributed to the scarcity of humble bees. It had been doubted by previous speakers whether the red and the white clover flowered together; but they do flower extensively at the same time. Darwin says that insects, whether hive bees or humble bees, visit flowers of the same species so long as they can; hence, where white clover is in bloom, hive bees continue to gather nectar from it as long as it lasts, so that there is significance in the market phrase, "white clover honey." There is no more crossing between red and white clover than there is among beans of different species. The non-fertilization spoken of in an isolated stalk of corn is owing to a deficiency of pollen, more than to the want of cross-fertilization. The same rule holds in regard to animals as to plants—the progeny of a scrub crossed with a high bred animal will be larger than the thoroughbred. In Darwin's experiments tobacco formed a curious exception to other plants; only one crossed plant out of three showed superiority over the self-fertilized. It would be well for farmers and seedsmen to consider the practical points brought out in Darwin's new book.

Mr. Hovey thought that a portion of Mr. Darwin's views, such as those relating to carnivorous and gregarious plants were sensational; but he did not apply that term to his experiments. Mr. Hovey quoted from Prof. Gray's lecture at Mount Holyoke Seminary, in September, 1875, as reported in the "Scientific Farmer:" "All showy, fragrant, and honey-bearing flowers are arranged for cross-fertilization. Nature abhors in-and-in breeding, and, like a wise teacher, shuns it in practice." In the "American Agriculturist" for January, 1877, Prof. Gray says, "Cross-fertilization, we may well believe, is the best thing, but it is risky. Cross-fertilization,

tempered with self-fertilization — which is the commoner case — is practically the best, on the whole, under ordinary circumstances—is the compromise between the two risks, viz.: failure of vigorous and fertile posterity on the one hand, and failure of immediate offspring on the other. Get fertilized, cross-fertilized if you can, close-fertilized if you must—is Nature's golden rule for flowers." Mr. Hovey agreed with Prof. Gray in his later views—he thought cross-fertilization desirable, but carried on at great expense.

The Chairman said that Prof. Goodale's statement was much stronger than Prof. Robinson's. He (the Chairman) had thought the flowers of the *Kalmia* arranged for self-fertilization, but according to Prof. Goodale, it was one of the instances going to prove the rule of cross-fertilization.

John B. Moore said that he had raised three hundred seedlings from the Rivers' Eliza strawberry, and had in every instance reproduced the parent, or else had got a variety not quite equal to it. The case was the same with the Large Early Scarlet, though both these varieties were growing with twenty others. He had found that the simplest and easiest way of producing new varieties was to select a pistillate kind, and plant it away from all others except that with which he wished to fertilize it. In this way he was sure of getting a cross. Corn is one of the easiest plants to operate on. The spindles should all be cut from the variety which you wish to make the mother, before they have fertilized it.

Mr. Moore agreed with Mr. Hovey that Darwin is sometimes romantic and fanciful, and mentioned as an instance the account given by him, and quoted with approval by Prof. Chadbourne at a late meeting of the Massachusetts Board of Agriculture, of an apple tree at St. Valery, "which, from the abortion of the stamens, does not produce pollen, but being annually fertilized by the girls of the neighborhood with pollen of many kinds, bears fruit 'differing from each other in size, flavor, and color, but resembling in character the hermaphrodite kinds by which they have been fertilized.'" Mr. Moore said that an experience of sixty years in the culture of fruit forced him to differ from Prof. Chadbourne. He did not believe anything he saw in a book unless it appeared reasonable to his own mind.

Mr. Wetherell also agreed with Mr. Hovey that Darwin was sometimes romantic, and thought his book on "Cross and Self-Fertilization," the most practical work he had written. This sub-

ject has a practical side, of much interest both to seed growers and seed planters.

The Chairman inquired whether any one had any facts to present in regard to fertilization under glass.

F. L. Harris replied that he had had some success in crossing *Dracænas*. He had fertilized *Mooreana*, a species having a self-colored, deep bronze leaf, with *regina*, and produced twenty-five plants of which no two were alike, and all partook of the properties of both parents. One of them had a leaf larger than that of either of its parents, and several of them were really superior to either parent. Mr. Butler, gardener at Wellesley College, has crossed *regina* and *terminalis stricta*, and the progeny was much superior to Mr. Harris' seedlings. These were both variegated kinds, instead of a self and a variegated, and more vigorous, yet he produced pigmies, which made most beautiful table ornaments. Mr. Harris operated artificially, first removing the stamens, which he believed to be the true way. He had found *Dracæna congesta* fruit readily, while other species do not; the *congesta* may have been fertilized by insects, and yet this is doubtful, for it fruited in winter when no insects were around. Tropical plants do not fruit readily in greenhouses; he did not believe that a cucumber ever fruited under glass without artificial aid. He thought that grapes had the power of fertilizing themselves so as to produce fruit, but European gardeners declare that it is necessary to syringe the Muscat. He thought the failure to produce fruit under glass might be owing to the absence of insects.

Mr. Hovey said that a breeze was needed to start the pollen. As a general rule the house is kept rather close. The Muscat of Alexandria grape requires heat to burst the anthers. He did not think that each flower would fertilize itself.

Mrs. Wolcott said Mr. Hovey's remarks implied that cross-fertilization would be produced by the current of air.

Mr. Wetherell alluded to the danger of cross-fertilization among plants of close affinity, as the cabbage, squash, and other families. Darwin planted a white kohl-rabi, a purple kohl-rabi, a Portsmouth broccoli, a Brussels sprout, and a sugar-loaf cabbage near together and left them uncovered. Seeds collected from each kind were sown in separate beds; and the majority of the seedlings in all five beds were mongrelized in the most complicated manner, some taking more after one variety and some after another. The

effects of the kohl-rabi were particularly plain in the enlarged stem of many of the seedlings. Altogether 233 plants were raised, of which 155 were mongrelized in the plainest manner, and of the remaining seventy-eight not half were absolutely pure. He repeated the experiment by planting near together two varieties of cabbage with purple-green and white-green lacinated leaves; and of the 325 seedlings raised from the purple-green variety, 165 had white-green and 160 purple-green leaves. Of the 466 seedlings raised from the white-green variety, 220 had purple green leaves and 246 white-green leaves. These cases show how largely pollen from a neighboring variety of the cabbage effaces the action of the plant's own pollen. Such facts reported by so skilful an experimenter and observer as Mr. Darwin, remarked Mr. Wetherell, should be kept constantly in mind by all growers of seed, whether for vegetable or floral culture.

Prof. Robinson said that in many cases the stigma ripens before the pollen is perfected, or *vice versa*.

E. H. Hitchings mentioned the *Sabbatia chloroides* as an instance of the flowers referred to by Prof. Robinson—the pollen ripens before the stigma is mature.

The Chairman remarked that whatever might be thought of the peculiar views expressed by Darwin, he was an earnest seeker for facts.

C. M. Atkinson was sorry to hear any one speak of romance in connection with Mr. Darwin. He thought that, with the same facts before him in regard to the subject under discussion, Prof. Agassiz would have come to the same conclusion as Darwin. Mr. Atkinson mentioned the pelargonium as a plant incapable of self-fertilization, as was shown by Foster and Beck, two of the most extensive experimenters in raising new varieties of that plant. The stamens are ripe before the pistil, and if you wait for seed to be self-fertilized you will never get it. The appearance of purple grains in the ears of white or yellow corn, shows that cross-fertilization has had its effect in that instance. When strawberries are grown under glass, unless they are fertilized with a camel's hair pencil, or a hive of bees is placed in the house, the fruit will be knurly and undeveloped. To produce a perfect strawberry, every pistil in the flower must be fertilized. He had grown, at the late John P. Cushing's, strawberries under glass to measure five and a quarter inches in circumference, when there was a hive of bees in

the neighborhood, some of which came into the house. A current of air is not sufficient.

Mr. Hovey said that it was well to know what we wanted to arrive at, and the question was whether cross-fertilization was necessary to keep up the vigor of the race. He admitted the facts stated in regard to the *Dracœna* and the strawberry. Moisture is unfavorable to the dissemination of pollen.

Mr. Wetherell alluded to the breeding of cattle as analogous to the breeding of plants,* and said that the shorthorns of the Duchess family, bred in-and-in, are the most perfect animals of the cattle kind that the world has ever seen. He spoke of the Duchess cow, at the York Mills sale, that brought $40,600. Though cross-fertilization may produce large and perfect plants, the question is whether individuality can thus be perpetuated. He thought crossing with inferior and unimproved varieties would impair the vigor of plants, and that the less there was of foreign pollen the more perfect would be the plants propagated from seeds.

The Chairman remarked that Darwin produced monstrosities by breeding in-and-in, and that the question is, what we call a perfect plant.

Mr. Wetherell asked whether it was not understood by botanists, that all plants in their original state are perfect, and that the garden varieties are monstrosities.

The Chairman replied, that technically they were, and referred to Darwin's illustration from the gooseberry. It is a fair question how far, in our efforts at improvement in particular directions, we interfere with the general development of the plant.

Mr. Hovey agreed with the Chairman that all plants and trees out of the common course are monstrosities. Cross-fertilization has not kept up the individuality of plants, but has changed it. Roses with a tendency to double, become entirely changed in three or four removes from the original. The wild touch-me-not is precisely the same as it was fifty years ago, but if removed to the garden it would doubtless have been changed. Mr. Hovey asked how such a pear as the Duchesse d'Angouleme, which was found growing wild, was produced. He thought cross-fertilization likely to lead away from the original type.

*The following note is added by Mr. Wetherell: "Sexual reproduction is so essentially the same in plants and animals, that I think we may fairly apply conclusions drawn from the one kingdom to the other." Charles Darwin, in "London Agricultural Gazette," April 2, 1877, p. 324.

Prof. Robinson said that Mr. Hovey had confused cross-fertilization and hybridization. We should keep distinct the perpetuation of the race, and the improvement of varieties.

H. Weld Fuller asked whether Nature was not always exercising a strong recuperative power, and making an effort to protect herself. He thought this power was shown in the tendency of variegated plants to revert to their original type. Darwin is a most careful observer and a faithful recorder; if he believes that certain matter was created with innate power of reproduction, self-preservation, and indefinite renewal, the great Author of that power is not thereby ignored! Darwin does not destroy the necessity of a *first cause*. The endowment of a seed with the capacity of development into varieties remarkable for their beauty or use, is as wonderful as the creation of those varieties would be. Human ingenuity may contrive a clock which may run for a week or a year, but it can give no vitality or endless energy to its materials. It requires a God to construct one which will run through all ages, renewing itself continually and knowing no change or stop. Mr. Fuller thought the principles of hybridizing were well understood; the way is to get the best varieties of everything and breed from them.

The Chairman said that we should endeavor to preserve the distinction between cross-fertilization and hybridization. Prof. Goodale's point is that Nature adopts the principle of cross-fertilization largely for the purpose of suppressing changes.

Mr. Wetherell expressed his satisfaction that Prof. Robinson had made the distinction between cross-fertilizing for the perpetuation of the race and for the improvement of varieties.

Mr. Hovey remarked that the difference between hybrids and other crosses is that the former are not fertile.

The Chairman said that the close attention given to the discussion for two hours showed the practical interest of the subject. A motion was made to continue the discussion the next week, which was carried.

MEETING FOR DISCUSSION.

SATURDAY, February 24, 1877.

W. C. Strong, Chairman of the Committee on Publication and Discussion, in the chair. The subject of Self and Cross-Fertilization, as presented by Prof. Goodale, being again assigned for consideration, the following outline of the lecture, made by Prof. Goodale, was read by the Secretary, that the position of the lecturer might be clearly understood.

I. By self-fertilization, or close fertilization, is meant the impregnation of a pistil by pollen from its own flower.

Conrad Sprengel, in the last century, and Andrew Knight, early in this century, showed that many flowers are incapable of fertilization without insect or other foreign aid.

Mr. Darwin, in England, Müller and Hildebrand in Germany, Axtell in Sweden, and Gray in America, have greatly enlarged the list of flowers which require insect aid to ensure their fertilization. These flowers are termed "cross-fertilized."

II. The mechanism of cross-fertilization may be said to be by

1st. Separation of the sexes.

2d. Different dates of maturity of stamens and pistil.

3d. Inaccessibility of the stigma, as in orchids, etc.

4th. Certain movements which ensure transfer of pollen.

III. Mr. Darwin, in his recent work on cross-fertilization, establishes the fact experimentally that plants which can be, and are, as a rule, self, or close fertilized, become in a few generations greatly impaired in vigor, as contrasted with the same species cross-fertilized, and unequal to contend with them in the struggle for life.

IV. Many disputants of late have asserted with reason, that a good many plants can be self-fertilized. This is not denied by any scientific man of any repute. What is claimed, and what is in perfect consonance with such statements is this; namely, most plants can be in some way cross-fertilized, and this cross-fertilization, *even in those species which can be close fertilized*, ensures greater vigor in the progeny.

It must be noticed that in some recent publications bearing upon close fertilization, the fact that experiments covering many years

are better than those which cover barely one, appears to have not received sufficient attention.

Hybridization, the impregnation of one species by the pollen from another, does not lie in our present path.

The Chairman mentioned the point that if suppression of individuality, was Nature's law, in his view it conflicted with the doctrine of evolution.

Marshall P. Wilder agreed with the Chairman as to the conflict between these views. The subject as illustrated by Prof. Goodale, was new to him, as was also the application of the term cross-fertilization to the fertilization of a flower by another flower on the same stem. Knight and Herbert, in their writings on cross-fertilization, apply it to the fertilization of one variety by another. Though Mr. Wilder had a great regard for scientists, he believed that God ordained that plants should self-fertilize, each plant "yielding seed after its kind." Corn and other plants are kept pure by self-fertilization, so that we get the exact varieties. If a plant fertilized by its own pollen or by a companion, produces a seedling like itself, we have made no progress in improvement. Working horticulturists have discovered that species could be crossed, and the speaker preferred careful cross-fertilization by hand, as the surest method of improvement in the production of new varieties, to impregnation by insects or the wind. We have an absolute law by which we can coöperate with nature in this improvement of species, both animal and vegetable. Lindley says weak parents produce weak children, and their children are still weaker.

Mr. Wilder called attention to a group of eight azaleas, three years from seed, exhibited by him, in fulfilment of his promise at one of these meetings, to produce seedling azaleas in flower in much less time than is commonly supposed to be required.

The Chairman said that the beauty of Prof. Goodale's position is that he is seeking for facts. Our object also should be to ascertain facts.

Mr. Wilder said, in regard to the incapability of plants of fertilizing themselves, that when the anther bursts, the pollen becomes almost ethereal, filling the air like the spores of a puff-ball when burst. The Willey strawberry is a pistillate variety, with large and vigorous foliage, completely hiding the flowers, but if a pistillate variety is growing near, the pollen will so pervade the air as to fertilize every flower under that dense mass of foliage. Some plants

are not so much capable as others of fertilizing themselves. Why do we plant each variety of corn and squashes by itself, but to keep the variety from fertilization by others?

The Chairman referred to the various contrivances described by Prof. Goodale for preventing self-fertilization in orchids.

Mr. Wilder said that varieties were so likely to be impregnated by pollen floating in the air, that when we would fertilize a flower with the pollen of a particular variety, we must cover the style with gauze to prevent fertilization by other than the desired pollen. When we want to raise a seedling possessing the good points of a weak growing variety, but with greater vigor, we impregnate with the pollen of a strong grower; or if we have an excess of vigor, which it is desired to reduce, we reverse the process; and when we have gained the desired improvement, if we keep the plant separate from others we have the same variety to the end of time. The longer he lived the more was he impressed with the importance of cross impregnation, and the more convinced that it is the best way to obtain great improvements. We cannot rely on accidental impregnation for them. Providence seems to have placed in our hands all the data we need for originating improved varieties. Mr. Wilder referred to a paper on hybridization, by Mr. Herbert, published in the "Journal of the London Horticultural Society," Vol. II, pp. 1 and 81, as covering the whole subject of the improvement of varieties.

Edward S. Rand, Jr., asked for any well authenticated fact in relation to the crossing of two well defined species.

Mr. Wilder said that the question was too strict, botanists not being agreed as to what constitute species. The rhododendron and azalea have usually been classed as distinct genera, and yet they cross readily.

Mr. Rand replied that he supposed Mr. Wilder referred to gesneraceous plants, but that he had yet to learn of the crossing of two well defined species. He did not consider the rhododendron and azalea well defined genera.

Leander Wetherell said that the different species of the lily, when growing wild, perpetuate themselves without variation of kind, but when cultivated they produce varieties. The same is true of animals, and he named the Ancon breed of sheep as an instance. If you wish to produce a vigorous race, cross-fertilization is essential. Darwin says that if you wish to perpetuate any peculiarities in a

plant, you may do it by fertilizing from its own pollen, or from that of any other plant of the same stock; but you must not allow cross-fertilization. Some maintain that permanent varieties are identical with species. In hybridizing between species you produce mules. Mr. Wetherell asked whether pigeons of the forest did not perpetuate their kind. Those in domestication show great variation. In the former case man has not interfered; in the latter he has. It is the same with the robin and the squirrel. You can propagate a deformity as well as a beauty. In some instances it is for the interest of the farmer to produce variations. In corn it is not the want of cross-fertilization, but of fertilization, that produces imperfect ears, as shown by a plant standing alone, to which reference had been made by a previous speaker.

E. W. Buswell remarked that the row of corn on the windward side of a field is more deficient in ears than those in the centre of the field, the pollen being blown to leeward.

The Chairman understood the experience of the breeders of fancy pigeons to have a direct bearing on the subject. Darwin claims that he can produce monstrosities in animals, and the principle is the same with plants.

Mrs. J. W. Wolcott asked whether Mr. Wilder had not shown that in almost every instance cross-fertilization is brought about by the aid of man.

Mr. Wilder replied that it was not; the pollen floats in the air, which is so filled with it that if there is a stigma anywhere, the pollen will seize on it as quickly as fire on gunpowder.

M. H. Merriam said that there was much confusion in regard to the original types of plants and animals. His view is that there is a feral type, towards which there is always a tendency to return. A flock of pigeons left to breed in-and-in returned to the feral type in a comparatively short period of time. This, however, is not inconsistent with individuality, but each may have distinct characteristics. Circumstances, known and unknown, produce peculiar characteristics, and hence we have varieties. In the ordinary operation of natural causes, plants will be fertilized both ways, for widely disseminated influences are always in operation to produce this effect, unless special measures are taken to prevent it. There can be no question that self-fertilization does occur, and cross-fertilization does also, because the causes are so universal. The cultivator should guide the process of cross-fertilization so as to produce the

results he desires. The question for him is, how he can unite the properties of two varieties so as to count certainly on the result, instead of leaving it to the operation of natural causes, which elude our control or observation.

Benjamin P. Ware said the question before us is whether Nature provides for self-fertilization or cross-fertilization. It seemed to him that all the facts brought forward as illustrations, tend to show that Nature more generally provides that blossoms should be fertilized from the pollen of neighboring blossoms, rather than from that of their own. The fact that a plant of corn growing alone fails to produce well filled ears shows that it is dependent upon neighboring plants to supply pollen for complete impregnation. The ethereal nature of the pollen of most plants seems to make it peculiarly fitted to be carried by the wind to fertilize other blossoms than those in which it was produced.

Edward S. Rand, Jr., said that Nature aimed only at the perpetuation of the species. This was mainly done by means of seed, and all the various methods of distributing the pollen, by wind, insects, gravitation, or other agencies, were exerted solely with that end in view. Man avails himself of these results, and often Nature's so-called accidents prove superior to the fruit of his best directed efforts.

In reply to a question from Mr. Wetherell as to the fertilization of orchids, Mr. Rand said they were generally incapable of fertilization without the aid of some foreign agency, and that insects were the agents employed by Nature to secure the perpetuation of this class of plants. In performing this service the insects are blind agents, doing the work while seeking food. The orchid flowers are so formed that in order to get at the honey, a violent disruption of the flower is generally necessary, and the sticky masses of pollen are often carried away on the heads of insects, who thus effect fertilization. In illustration of these remarks, Mr. Rand mentioned the singular structure of *Angræcum sesquipedale*, an orchid peculiar to Madagascar. (See the TRANSACTIONS for 1874, Part I, p. 26.)

Rev. A. B. Muzzey thought this subject required a knowledge of science. Sometimes the cultivator appeared distrustful of the scientist in the discussion of questions like the present, and would look only to practical laborers for any reliable information. This should not be; he thought both classes could aid in such discussions. The cultivator could furnish the facts needed in each

case, and the scientist could use them in reaching right conclusions and opinions in horticultural pursuits. They should never be jealous of each other, but should work together as friends and helpers. This would be for the enlightenment and service of the whole community.

During the discussion much had been said of the work of Nature, as if it were a distinct thing from the work of man. But in truth they were both operating in the same direction, if not always in the same way. The mind of man is indeed a part of Nature, and its efforts are designed to be toward the one great end, a perfect culture. It is through man that her highest processes are to be developed. Human means and instrumentalities are essential, both to a correct knowledge and a right use of Nature. This idea would help us in the consideration of our present subject, as in all others of a like delicate and complex character.

John B. Moore remarked that it was fortunate that trees are not liable to be influenced in their fruit by the pollen of other trees. If they were, a man might plant a Bartlett pear tree, and gather any variety or any number of varieties; and where trees were so situated as to receive the pollen of other varieties, we should never be sure what kind of fruit our trees would bear.

E. W. Buswell mentioned a fact of which he was reminded by the allusions that had been made to the manner in which insects follow flowers. Being very fond of humming birds, and noticing that they visited flowers with deep nectaries, he planted large numbers of honeysuckles, four o'clocks, and similar flowers. This plan was entirely successful; his garden was visited by multitudes of humming birds, which grew friendly, and even familiar. A pair of large green humming birds would come and poise on their wings before his face, and play over a bouquet of flowers which he held in his hand.

BUSINESS MEETING.

SATURDAY, March 3, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President Parkman in the chair.

W. C. Strong, Chairman of the Committee on Publication, an-

nounced that Part II of the TRANSACTIONS of the Society for 1876, was ready for distribution.

WILLIAM E. BOWDITCH, of Boston Highlands, and
HIRAM WILDE, of Randolph,

having been recommended by the Executive Committee, were duly elected to membership.

Meeting dissolved.

MEETING FOR DISCUSSION.

The Chairman of the Committee on Discussion announced the subject of the lecture delivered before the Society by Mr. Halsted, on the 27th of January—Injurious and other Fungi—for discussion at this meeting.

Charles M. Hovey said that the injurious effects of fungi were well known, but it was a question in regard to many diseases in plants, where the presence of fungi was noticed, whether these diseases were caused by the fungi, or whether the fungi were the consequence of the disease. The leaf blight, which attacks the foliage and fruit of the pear in the form of black spots, causing the leaves to drop, is well known to be a fungus. The fungus which causes the potato rot has been thoroughly studied and elucidated by writers in European journals, the "resting-spores" having been discovered within a year or two. The best remedy is to plant early varieties, and to plant and harvest them early, before they are affected by the autumnal rains. We are all familiar with the mildew on the grape vine and with the remedy. Mr. Hovey concluded by expressing the hope that microscopic investigations of all the fungi which are not yet thoroughly understood, would be pursued until some means of preventing the injury which they cause is discovered.

William C. Strong remarked that in some particulars the subject was well understood, but in others it was not well known.

President Parkman mentioned the "fungus of the cutting bench," as one of which nothing was said by the lecturer, but one which comes very near to our feelings, if not to our interests. It is an insidious enemy, which in a night will destroy yards of cuttings, but for which no remedy is known.

Mr. Hovey said that he had found hot, dry sand—as hot as possible without injuring the plants—strewed on the cutting bed, a remedy,

though not complete and thorough. The fungus seems to thrive best in a certain temperature and moisture, which the hot sand corrects.

President Parkman said that prevention is better than cure, and that this was best effected by careful attention to the purity of the sand, and to maintaining a proper temperature and moisture. Where the fungus has destroyed cuttings, the sand is observed to be netted with small white filaments.

Mr. Strong thought the means recommended by the President as a preventive would tend to cure the trouble.

Mrs. J. W. Wolcott asked whether it would not be possible to find the spores and destroy them before the mycelium was formed. It appeared that no one had observed the fungus until it had done the mischief.

President Parkman replied that a long course of scientific observation would be necessary to gain the knowledge suggested, and that such investigation was very desirable. Perhaps by it some remedy might be discovered, as in the case of the plum knot. The observation which can be given by cultivators is not of the minute character necessary. After raising a crop or two of cuttings, the sand becomes filled with vegetable matter, and should be kept continually clean by washing.

Mrs. Wolcott asked if it was not possible to persuade cultivators to accept the discoveries of scientific men, and to save themselves from pecuniary loss by preventing fungus. She thought there was an opposition among gardeners, which was much to be regretted, to accepting and acting upon such discoveries.

President Parkman replied that scientific investigation was as important in horticulture as in other matters, and that the highest practical results could not be had without it.

Mr. Strong thought that we should be modest and not attempt to go beyond our depth in these discussions. He had observed various facts in regard to the fungus under consideration. He had noticed that its growth depended on a humid condition of the soil and atmosphere. He alluded to the remedy proposed by Mr. Hovey, and said that, besides this, thoroughly aerating the sand every time of using would be beneficial.

Mr. Hovey had never noticed any mycelium, more than a web over the bed, which seemed to be composed of infinitesimal particles of water. This web was over, rather than in, the soil—not over

the cuttings, but about a sixteenth of an inch above the surface of the soil. Another kind is quite white, in a thin layer and more distinct. The condition of a bed affected with this fungus appeared to him similar to that of a room so crowded with people that they had not sufficient air. When planted wide apart, with plenty of air, the cuttings do not appear so liable to injury as when crowded. The fungus will go through a bed and kill the base of the cuttings while the top is uninjured.

Mrs. E. M. Gill said that her cuttings were entirely killed, top and bottom.

Mrs. Wolcott asked Mr. Hovey if he did not think that under the web which he described, he could, with a microscope, find the mycelium of this fungus.

Julius A. Palmer, Jr., said that the remarks of the previous speakers would convey the impression that all the fungi were enemies of the horticulturist, but while some of them were destructive of food, others were valuable for food. Among the latter is the *Agaricus ulmarius*, a large white fungus, growing on the elm tree, and which there is no danger of confounding with any poisonous species. The Common in spring is covered with a little black toadstool, *Agaricus* (*Psilocybe*) *fœnisecii*, which is excellent food. Any puff-ball that is white when broken open is not poisonous. So late an authority as Dr. Curtis classed the *Coprinus comatus* among the poisonous species, but it is generally considered harmless. Among the known puff-balls there is not one of those which are white when opened that is poisonous. If on cutting open a puff-ball any trace of yellow is left on the knife, this is an evidence of decomposition, and fungi in this state are as unwholesome as tainted meat. In answer to an inquiry how he cooked puff-balls, Mr. Palmer stated that he broiled them.

James Cruickshanks said that he had been much interested in the facts given us by Mr. Palmer, but he would recommend every one to be very much on their guard as to what they ate. When a journeyman gardener, he saw what he supposed to be some very fine mushrooms. He took them in and broiled them, and ate a portion, and a short time after he was, for two hours, as near being poisoned as ever a man was who escaped. He supposed the hurtful character of these fungi was due to their growing near pine trees.

Mr. Palmer said that the eatable fungi are not marked by their attractiveness, and mentioned a case where a family were poisoned

by eating a white mushroom of attractive appearance. There is only one safe ground, — to know them as well as we know our common vegetables. It would be difficult to describe the difference between the bulb of a hyacinth and that of an onion, yet no one would ever mistake one for the other; and so while it is difficult to describe in words the distinction between different mushrooms, it is not difficult to distinguish them by the eye when once educated to do so. The speaker thought the poisonous qualities of mushrooms exaggerated. He had eaten forty different kinds. There are in Massachusetts perhaps a thousand different varieties—as different one from another as a cherry is from a plum, or a raspberry from a strawberry.

In answer to an inquiry Mr. Palmer said that he did not think there was any danger of finding deleterious species among the mushrooms of commerce, as there is no variety likely to make its appearance in the beds of the cultivator, which he could not easily distinguish from the true kind.

Mr. Hovey said there was no doubt that many of the fungus tribe, the mushroom and truffle especially, are very valuable, forming excellent, agreeable, and pleasant food. Though several are known to be harmless, in our present state of knowledge it is rather dangerous to eat those with which we are not familiar. The *Coprinus* and the common mushroom are distinct, and there is also a small brown one known as the almond mushroom, having a taste like almonds. The common mushroom is well known, and if we get to be as familiar with the family generally as we are with beets and turnips, they would be available as food. At present the number esteemed as wholesome will not count much in comparison with the injurious species.

Mr. Palmer said that the profusion of food in this country was such that we had availed ourselves of the fungi to a very small extent only, but in other countries it was different. The Chinese and Japanese would regard our waste of fungi as we should the rotting of grapes in the vineyard. Large quantities of mushrooms are eaten by the Chinese in California; they are grown in Mexico and imported from thence into San Francisco. The speaker said that he ate the common horse mushroom, or champignon, and regarded them as nutritious. They are rich in nitrogen and take the place of meat, yielding a gravy like that of meat. They live like animals, absorbing oxygen and giving off carbon—the reverse of phænogamous plants.

Leander Wetherell asked whether any of the fungi were poisonous at times, and at other times innoxious.

Mr. Palmer replied that a poisonous species is so from the moment of its birth; a wholesome one is so until it decays. Eventually they are attacked by maggots and go the way of all living things.

Mr. Wetherell said that many farmers have stated that their cattle have been poisoned by eating the corn fungus, while a writer says this is extremely rare. There was more of this fungus the past season than ever before, though it is said to be most prevalent in wet seasons, and the last summer was very dry. He never saw so much in all his life before, as he saw in one cornfield of about three acres; but he heard of only now and then a case of poisoning. He thought the liking for fungi as an article of food, an acquired taste, and he would give the same advice in regard to using them as he did to a young lady who was going out to collect autumn leaves, and asked how to avoid dogwood, ivy, and other poisonous plants, viz.: to gather nothing but what you know is harmless.

Mr. Palmer agreed entirely with the gentlemen who thought no one should attempt to gather or eat mushrooms until they could distinguish between the harmless and noxious so as not to feel the slightest fear. People would sometimes bring him six different kinds for a name, not recognizing any difference between them. He did not think the taste for mushrooms was an acquired one. The noxious fungi have a slimy taste, or an earthy flavor; on the contrary the wholesome ones have an appetizing flavor. We shall never learn the distinction between the wholesome and the poisonous kinds by sitting down and saying that no one knows anything about them.

John C. Hovey said there were many eatable kinds; he had himself eaten seven different kinds. He thought we should study and know them as well as we know a Bartlett pear. Those which he is acquainted with he knows certainly.

Mrs. Wolcott asked whether the discovery of more smut on the corn last year than before, was not in consequence of the failure to take the advice of scientists, and destroy the spores. If there were half a dozen heads filled with smut, that was enough to seed all Worcester county. She thought the farmers might eradicate it if they would.

The Chairman of the Committee on Discussion announced for the next Saturday a discussion on the subject of Dr. Slade's Prize

Essay, the Improvement and Ornamentation of Suburban and Country Roads.

MEETING FOR DISCUSSION.

SATURDAY, March 10, 1877.

The chair was occupied by W. C. Strong, Chairman of the Committee on Publication and Discussion, who remarked that the Hybrid Perpetual Roses exhibited by John B. Moore were the finest ever seen here, and before taking up the topic assigned for discussion, called on Mr. Moore for information as to their culture.

Mr. Moore said that a great part of whatever credit was due for the roses belonged to his son, but that they had not yet succeeded in growing them up to their ideas of perfection. They were grown in pots during the summer, and after the wood was ripened were placed in the house. This was done about the middle of December, previous to which time the tops, and sometimes the soil in the pots, were frozen. He endeavored to prevent rather than to destroy insects, and to this end smoked the plants once a week, whether any insects were visible or not. The only insects he had had besides the green fly, were a few green worms. The plants exhibited were potted on last spring and were bloomed in the same pots that they were in last summer. He shifted once a year; the largest plants were imported two years ago. The pots were plunged two-thirds of their depth in coal ashes, while out doors, and about three feet apart in the full sunlight. Mr. Moore thought it very important to plunge them a sufficient distance apart to give plenty of air between. They were watered once a day, or twice if they needed it, from the hydrant, with considerable force. When the weather became so cold that there was danger of bursting the pots, the space between was filled with leaves. When the plants were first placed in the house the temperature was kept quite low, but afterwards they had more warmth. They were grown in a low house, and there also were watered from a hydrant with a hundred feet head, though the full force was not used. He had been cutting flowers for more than a month. He did not think it made much difference whether the tops were frozen or not, but thought it did some good. The main thing is to ripen the wood.

The Chairman remarked that if frost was not necessary the wood might be ripened much earlier than if it was.

Mr. Moore continued by saying that he was not yet satisfied as to the best way of pruning. Some growers recommend cutting down to three or four buds, but strong growers must be pruned longer than weak ones. He cut enough flowers last summer to pay for the care of the plants.

E. W. Buswell asked Mr. Moore whether he thought it preferable to expose the plants to frosts or to ripen the wood by drying.

Mr. Moore replied that he had practised but one method, — freezing, — though he had withheld water in the fall. He did not think the bottoms of the pots had been frozen, but the surfaces certainly had.

James Cartwright said that he had adopted the same method as Mr. Moore had described, but had planted some out and did not see much difference between them and those grown in pots. He generally froze them, but had some not frozen and did not see much difference.

Mr. Moore said that he struck a lot of plants last spring, which were coming into bloom.

Mr. Cartwright said that he intended to grow all his plants outdoors next year. He thought young plants did better than large ones. He did not think that plants in pots bloomed earlier than those planted out. In his opinion, all the roses forced to bloom at Christmas cost more money than could be got for them.

M. H. Merriam said that from his experience the present winter, he had come to the conclusion that forcing roses which had not been exposed to frost was not successful. There are some plants which it is necessary to ripen off and expose to a certain degree of cold, among which are the lily of the valley and the strawberry.

Charles M. Hovey said there is no frost in Southern California, yet pears are grown successfully there. He did not know that pear trees are benefited by frost. It is true that the California pears are not equal in flavor to those of Massachusetts, but, so far as growth and productiveness are concerned, they have settled the question whether frost is necessary to the pear. It appears from the attempt of Mr. Simpson to grow three crops of grapes in two years, that a period of rest is necessary. The leaves fall without any frost, from want of sufficiently high temperature. To produce fruit there must be a preparation of the sap, which in certain varie-

ties of the pear, such as the Dix, is not effected in less than ten or fifteen years. Time is required to prepare and consolidate the juices. Tea, and other ever-blooming roses, do not succeed if taken out of the ground and put immediately into the house; they require time to prepare for blooming, and should not be pruned too early, but you cannot check the growth entirely. For the majority of our common fruit trees, such as the currant, frost is not necessary.

The Chairman remarked that frost might be beneficial, even if not necessary.

Mr. Hovey did not think it was; Nature, in placing fruits in a northern climate, made them capable of enduring frost, but it is not a necessity to them.

Dr. E. L. Sturtevant's experience had been that exposure to a drought might give results similar to those produced by exposure to frost. The object of frost is to give the plants a rest, and this can be imitated by drought.

Mr. Hovey said that withholding water withholds a certain amount of vigor. Many plants will die if water be withheld for a day or two. Dryness will effect the ripening of the wood, but not as well as dryness with cold.

The Chairman asked, Why stop at the freezing point instead of going lower and giving the plant a more complete rest? He found when fatigued that a nap of a quarter of an hour refreshed him so that he could go on with his work.

E. S. Rand, Jr. said that anything that would produce a rest and a ripening of the wood, would effect the object in view. In our climate the agency is frost; the ripening of the wood of the pear tree is accomplished both with and without frost, according to the climate. Mr. Rand gave an account of his success in forcing roses the present winter. He had a house about twenty-five feet square, filled with roses — almost entirely Gen. Jacqueminot. The greater part of these were struck from cuttings nearly a year ago. They were turned out into the garden, and, the summer being dry, were occasionally watered. They made a good growth, and were taken up the last of November, pruned to from two to six eyes, potted in six inch pots, and placed in a frame which was covered at night. A crust froze on the surface of the soil in the pots nearly an inch thick. They were brought into the house in succession, much air was given, they were allowed to break very slowly, and watered with weak liquid manure. The advantage of year old

plants for cut flowers is that they give single buds, and there is no waste as with the older plants which flower in clusters. There is a great difference in the size of the plants; some have twelve or more buds, and some only three or four.

Mr. Merriam asked whether the effect of frost was not the same as the effect of time and drought, without frost. His plants put in without frost had done poorly.

Dr. Sturtevant gave his views in regard to the effect of drought and frost. When frost strikes a plant there is a change of densities, and in cases there is an apparent transference of nutrient matter from the outermost layers towards the interior. This same movement also seems to occur from the inspissation of sap through drought. The subject is, however, an intricate one, and must be used, if at all, analogically.

Mr. Hovey said it is admitted that the effect of frost is the same as that of heat. In Russia it has been proposed to cook food by subjecting it to intense cold. He had kept amaryllis seeds in a cold room, and they came up in half the time required by seeds which had not been exposed to severe cold. Frost acts as a premature ripening, and if the degree is not too great it does no harm. He had known Tea rose bushes to split open from the effect of frost.

The Chairman said that the practical question for us is, whether there is any way in which we can bring our Hybrid Perpetual roses into bloom earlier than we do now.

Mr. Cartwright said that he had forced this class of roses for seven years. He had always put them into the house the first of December, and the first year he began to cut flowers on the 7th of January; the next year on the 17th; this year on the 3d of February. Generally he began cutting from the 17th to the 20th of January.

The Chairman inquired whether he could not conceive of the ripening of plants so as to start them earlier, and Mr. Cartwright replied that he could not.

Dr. Sturtevant said that by a judicious application of drought he had flowered hardy roses at Christmas.

Mr. Cartwright had had roses in bloom before Christmas, but they cost him a dollar apiece.

Mr. Merriam said that his roses had, unlike Mr. Cartwright's, bloomed unusually early this year. He mentioned an instance where the culture of the grape had been attempted in a very moist climate

in tropical South America with poor success, and the roots of the vine were laid partially bare, thus producing an artificial drought, which caused good crops to ripen.

Mr. Rand called attention to the flowers of *Hexacentris Mysorensis*, exhibited by him. This is a new flower because old, having been introduced many years ago, and since gone out of cultivation. It is a native of Mysore, and a climber like the *Thunbergia*, to which it is closely allied. It produces racemes of richly colored flowers, of unique form, which, though they do not keep long in water, last a good while on the plant, presenting a very graceful appearance.

The discussion on roses continued so long that the special assignment, the Improvement and Ornamentation of Suburban and Country Roads, the subject of Dr. Slade's Prize Essay, was postponed for a week. It was announced that possibly Prof. Stockbridge, of the Massachusetts Agricultural College, might be in town on the next Saturday, in which case he would lecture before the Society on "Fertilizers," and the subject first assigned would be further postponed.

MEETING FOR DISCUSSION.

SATURDAY, March 17, 1877.

W. C. Strong, Chairman of the Committee on Publication and Discussion, in the chair.

The number of plants on exhibition was less than usual, but among them was one of *Rogiera elegans*, which C. M. Atkinson, who was called on by the Chair to give information concerning it, said was a native of the temperate regions of Gautemala, and a very valuable plant for exhibition, as it could always be depended upon for a specimen.

Mr. Atkinson went on to speak of the reports of the weekly exhibitions of the Society in the "Evening Transcript." He alluded to the feverish impatience with which the reports, in the "Gardener's Chronicle," of the London Horticultural Society's

exhibitions at Chiswick were looked for, and said that the reports of our own exhibitions in the "Transcript" were read with much eagerness. He thought it desirable that they should contain the names of varieties in prize collections.

Other gentlemen made some remarks on this subject, after which Professor Levi Stockbridge, of the Massachusetts Agricultural College, was introduced, and delivered a lecture, of which the substance is here given, on

FERTILIZERS.

Prof. Stockbridge expressed his feeling of obligation to the Society for the opportunity to give his views on a subject which he regarded as of the highest importance to the nation. The first idea that strikes an individual in considering the subject is that it has been discussed year after year and the same questions repeated under no new circumstances. The inquiry arises whether in this matter there is anything settled. Something ought by this time to be finished and made a rule of practice. In endeavoring to arrive at certainty in regard to this subject, we find, first, that there is in the United States, especially in the seaboard states, which have been longest settled, absolute necessity for artificial fertilization. The soil has been tilled so long, and so much has been carried away in the form of crops, that it is far less fertile than when cultivation began. This point being established, it follows, secondly, that the same state of things will always continue, unless the soil is assisted by artificial means. By Nature's processes, all crops decaying on the soil, it becomes marvellously fertile, but when we come we produce an entirely different state of things. All the agencies of Nature work together to prepare plant food, but our power to remove is greater than Nature's to prepare, and will so continue.

The third point is, How shall we supply by artificial means the deficiency which we have artificially created?

The first thing to do is to aid nature in developing plant food by tillage, under which term the speaker included all physical operations on the soil. The next is to put back, as far as possible, all material carried away. We find after using our crops that there is a certain amount of refuse left, and to put that back is the most natural way of supplying food to our crops. This brings us to barn-yard manure, the best fertilizer, for all the general purposes of the farm, that we shall ever find, for it not only feeds the plant, but produces important physical effects on the soil.

Our fourth point is, Will the waste of all material put back on the land in the most advantageous way, keep up its fertility? No, not if every particle is saved. According to the last census, there were in Massachusetts 942,000 acres of tillage land, while the whole quantity of farm yard manure, or fertilizers from the refuse of the crops, was but 422,000 cords—an average of only about one and a half loads to the acre. We must look outside of this source. Is there any substitute? The lecturer answered, Yes, — it is proved, not specially by him, or by Lawes and Gilbert, or by Liebig, or by Dr. Nichols, but by the individual experiments of each, that other substances will do the work of feeding plants.

Farmers ought to take in the fact that plants never feed on manure or soil as such; these become nourishment to plants only when such compound substances are taken to pieces, and separated into their original elements. We speak of piles, cords, or loads of manure, but plants never feed in bulk, either on phosphate in nodules, or magnesia in talc, or soda in mica, or potash in feldspar. These materials are of no use in those forms. The soil must be changed; yard manure must be changed, and that is the reason why we till our soils. Will not potash in the form of oxide of potassium be worth just as much to the plant as in the form of yard manure? Science and common sense say, Yes. There is no other conclusion to come to. In fact it must be better because more readily accessible.

Up to this point scientists and practical men agree — chemicals will answer the same purpose for plant food as yard manure. Are we ready to act on this conclusion? Pure science does not amount to much unless we can put it into practice on the land. We want to go on to our inaccessible, barren hills with substances which will enable us to do there what we do in our home lots with yard manure.

We have a soil that begins to fail. Why? Is it because everything that plants feed on is gone, or because only one or two elements are gone? A plant uses large quantities of potash, which is very scarce and very hard to develop from potash feldspar. In our New England soils the first element deficient is potash, and when this is gone crops refuse to grow. Sterility may result from the absence of one element, and common sense says, supply the missing element. Science further tells us to analyze the soil, to ascertain what the missing element is, and this is also good common sense,

but the trouble is that it is impracticable. The chemist, with his strong acids, will bring out potash where the plant cannot, and therefore he is not a correct guide. Not knowing the presence in the soil of the chemical constituents of plants in available form, is it possible to apply an artificial fertilizer which will supply all their requirements and which may be called a complete manure? It has been proved, and the fact is the common knowledge and property of every one, that in the soil of the seaboard states three elements are wanting, which if supplied will form a perfect manure. In the circumstances in which we are placed to-day, if potash, nitrogen, and phosphoric acid are compounded in proper proportions, we can, as a system, depend upon them as well as upon barn-yard manure, and in some respects they are superior. The question arises, Can we apply this system in practice? and here come in the Stockbridge theory and fertilizers. This theory asks, If these three chemicals make a complete manure, is there any rule by which to compound them for plants? Plants may differ greatly in their composition, and the same plant may have different components in its different parts. Is this composition accidental or in obedience to law? We know that we can compel or tempt a plant to take up unnatural material, but in general the composition of plants is by a fixed law. The manure must correspond to the composition of the plant; that for tobacco or onions must be made different from that for wheat. The Stockbridge theory says, Know your plant, give to it the materials required by its peculiar composition, and give them in soluble form. Other points have been established, and now the question is how to fit the plant. We must make a fertilizer for a potato in one way, and for corn or wheat in a different way, and make it so as to present the food in an available form. The gentlemen present knew something of this theory and how the formula for fifty bushels of corn or one hundred bushels of potatoes is stated. Those who know how much influence is exerted on our crops by the sun, frost, and air, ask whether Nature is not against us in the application of this theory. The lecturer admitted that certainly she was at times, and that owing to causes unknown to us, or not under our control, this system might sometimes fail, but he felt sure that, in the average of ten years, it would produce the results promised. There are a thousand side issues, and many *pros* and *cons*, and many questions may be asked, but an experience of eight or nine years on all soils had given him confidence in the system. It has

been tried and found equally beneficial in all the states, from Maine to Louisiana.

Facts gathered for and against the system, seem to prove that we may by this method very materially lessen the uncertainties which surround cultivators, and make the hills, the remote parts, and the sterile lands of our farms fertile. Prof. Stockbridge closed by repeating the statement that while some of the ideas which he expressed were original with him, others had long been common property, Liebig perhaps being first to publish them.

Discussion.

The Chairman said that Prof. Stockbridge could not have spoken on a more interesting subject, and that he would receive the thanks of all the ladies and gentlemen present. An opportunity would now be given for members who wished to ask Prof. Stockbridge any question, to do so.

William D. Philbrick said that Prof. Stockbridge had very clearly stated his theory, and that he felt that the thanks of the meeting were due to him. But he had not touched on the branch of husbandry in which the speaker was engaged, viz., market gardening. Market gardeners are differently situated from farmers in general, whose supply of manure is limited to the cattle kept on the farm. He could get all the stable manure he needed by paying for it, but he wished to be sure of growing the largest crops at the least expense for fertilizers. He wanted to know whether vegetables could be raised for market on Prof. Stockbridge's system.

Prof. Stockbridge replied that he disliked to go farther in theory than in practice, and that he had no practical acquaintance with market gardening. On a farm he would use chemicals in combination with barn-yard manure. Barn-yard manure is of uncertain composition, and the refuse of English hay and Indian corn cannot make the best manure for a potash crop. Early beets might be manured with part barn-yard manure and part potash, which would be cheaper than to use all barn-yard manure. In reply to Mr. Philbrick's question whether he could carry on a market garden entirely with chemicals, he would say that a market garden being, unlike a farm, tilled all the time, organic matter must be applied in some way, and he thought there was probably no better way than in stable manure, but on a farm it could be applied in a cheaper way, such

as by clover roots decomposing in the ground. He did not think he could do without these on a farm.

The Chairman asked why the organic matter might not be applied in a specific form, as for instance, peat composted with ashes.

Prof. Stockbridge replied, that while the yard manure effects this object, we might also apply straw or sea-weed, or vary the composition to suit the soil. The soil must be kept in proper absorbent condition.

Josiah W. Talbot said that he had made one definite experiment with the Stockbridge fertilizers. He took an acre of old pasture land which had not been manured for twenty or thirty years, and applied the formula for fifty bushels of corn, and kept a careful account of the cost of cultivation and other expenses. The produce was one hundred and thirty-seven bushels of ears, and the cost was not over forty cents per bushel of shelled corn. The fertilizer cost a little less than thirty dollars. In estimating the crop we should value all that we take off, and in this case the fodder nearly paid for the fertilizer. He did not think the land would have yielded fifteen bushels without the fertilizer. He did not try any comparative experiments, but his neighbors had land of the same character, manured with yard manure, which yielded more fodder but no better ears, the crop being about seventy or eighty bushels. He charged himself with all expenses and credited himself with the crop. He did not estimate the interest or the tax on the land, for it was nearly worthless. Applied to grass the fertilizer doubled the crop. On grapes the result was satisfactory. These need potash and phosphate, and but little nitrogen.

John B. Moore said that the Stockbridge fertilizer to produce fifty bushels of corn per acre cost twenty-seven dollars, and the freight was fifty-five cents, which would bring the cost of Mr. Talbot's corn so high that the experiment could not be deemed successful. He doubted whether northern corn was more valuable than southern, and the latter could be bought in Concord for sixty-five cents per bushel. He knew a hundred men who could make a better report than Mr. Talbot's.

M. H. Merriam said that he tried an experiment with the Stockbridge fertilizers on mowing land, which was not satisfactory. He had a field of three acres which had been in grass fifteen or twenty years, and sometimes neglected. A space of average fertility was measured off and the fertilizer applied to it, none being put on the

remainder of the field. The tract where the fertilizer was applied could not be distinguished from that where it was not. It was applied early in the spring and followed by abundant rains. This failure, however, had not shaken his confidence in the general correctness of Prof. Stockbridge's theory, for the road to success is through failures.

Robert Manning gave an account of an experiment similar to that made by Mr. Merriam, which resulted more satisfactorily. In a mowing field an acre was carefully measured, and the Stockbridge formula for English hay and clover was applied. The increase in the crop on this acre over that where no fertilizer was applied was very plainly perceptible, but the whole crop having been sold standing, the exact difference could not be ascertained. He was quite sure, however, that the increase in the crop of last year was not sufficient to pay the cost of the fertilizer.

Mr. Moore agreed with Prof. Stockbridge as to the value of the articles named as fertilizers, but in his view the theory could not be carried out. The formula for potatoes is, to produce one hundred bushels per acre, and in like proportion for other quantities. Suppose you wish to produce four hundred bushels per acre, and apply four times the quantity named, to soil extremely rich in nitrogen. In that case the potatoes would all run to tops, and you would not get any tubers at all. The effect would be precisely the same as every one has seen when potatoes were grown on the site of a manure heap. Mr. Moore agreed with Prof. Stockbridge, that a soil could not be analyzed so as to afford any valuable results to the farmer. Prof. Mapes would invite farmers to send him a little of their soils to analyze, and he would engage to tell them from it what fertilizer to use. Suppose the sample happened to be taken from a spot where cattle had dropped manure; it would then be impossible to arrive at any correct result. Or if you took an average sample there might be half a dozen different kinds of soil in one field. Analysis might show potash where there was none available for plant food. He thought that Prof. Stockbridge had done a great deal of good by bringing about the agitation of this subject, but he could distinguish no difference between the Stockbridge theory and that of Prof. Ville, which was promulgated many years ago. He had used all the articles of which the Stockbridge fertilizers are composed, for years.

Prof. Stockbridge was confident that four hundred bushels of po-

tatoes could be raised by his formula, for it was composed just as Nature compounds the materials when she makes a potato. Nitrogen is volatile and all the time escaping into the air, and if there is any nitrogen in the soil beyond what has been applied, and the plant begins to gather it, it must gather also phosphate and potash. It is almost impossible that there should be a surplus of nitrogen, unless you fertilize with yard manure. It has been asked, Where is the limit — why not make fourteen hundred as well as four hundred bushels? and supply the necessary air, carbonic acid, sunlight and heat. The farmer cannot go farther than Nature will go with him. The points stated by Mr. Moore are nothing new. The speaker was not sure that he knew what M. Ville's theory was, and he would like to know.

Mr. Moore replied that it was so long since he read M. Ville's book that he was unable to give an exact statement of his theory, but the book contained an account of experiments in the growth of plants in distilled water and sand, with the addition of the three substances which compose the Stockbridge fertilizers. In regard to the surplus of nitrogen in a soil, he knew that such a thing was possible. He was well aware of the value of nitrogen, and had used large quantities of plaster of Paris to fix it.

Prof. Stockbridge advised Mr. Moore to apply potash to soils which he suspected to contain nitrogen in excess. The new point with him is, that the best fertilizer for any crop is made by compounding nitrogen, potash, and phosphoric acid in available form and in the same proportions as those in that crop when perfectly mature.

Leander Wetherell read from the translator's preface to M. Ville's lectures on agriculture, as follows: "By adding, according to M. Ville's system, nitrogenous matter, phosphate of lime, and potassa— that is to say, a normal or complete manure—to calcined sand, the seed-wheat being equal to 1, the crop is represented by 23."

Prof. Stockbridge replied that that was not his theory. M. Ville did not make any statement in regard to mingling the substances; he did not say that the best manure for wheat would be made by combining these materials in certain proportions. The only rule given is in the first lecture—so many thousand pounds of yard manure are a good dressing for an acre for two years. If of average quality, it will have so many pounds of each constituent, and mineral fertilizers must be combined in the same proportions, but he does not give any attention to the composition of the plant.

Mr. Wetherell read from M. Ville's sixth lecture,—"First: There exist four regulating agents *par excellence* in the production of vegetables, — nitrogenous matter, phosphate of lime, potassa, and lime. Second: To preserve to the earth its fertility, we must supply it periodically with these four substances in quantities equal to those removed by the crops." Also from his first lecture: "The analysis of all known vegetables, or the products extracted from them, leads to this very unexpected fact, — that fifteen elements only concur in these innumerable formations. These fifteen elements, which alone serve to constitute all vegetable matter, are divided into two groups: — First: The organic elements, which are encountered only in the productions of organized beings, and the source of which is found in the air, and in water. They are carbon, hydrogen, oxygen, nitrogen. Second: The mineral elements, which resist combustion, and which are derived from the solid crust of the globe. They are potassium, sodium, calcium, magnesium, silicium, sulphur, phosphorus, chlorine, iron, manganese, aluminium."

Mr. Wetherell said it was taken for granted that all but the four substances named are contained in the soil; and Prof. Stockbridge had said that chemicals will do just as well as barn-yard manure in making crops. The speaker alluded to the sanguine gentleman who predicted a time coming when the manure for an acre of ground could be carried in the waistcoat pocket, and was answered by another gentleman that when that time came the crop could be carried in the other pocket. Mr. Wetherell asked, Why should we handle barn-yard manure if plant food can be furnished equally well with so much less bulk? If Ville and Professor Stockbridge are right in claiming what they, especially the latter, do, viz.: apply a given amount of fertilizers and harvest a given amount of corn per acre, say sixty or ninety bushels, then has farming become well-nigh an exact science. If the Massachusetts Agricultural College has reached this point it has made a valuable discovery, and only two uncertain points remain: one is atmospheric influences, and the other is the insects injurious to vegetation. If these two points can be settled as certainly as that relative to fertilizers, then farming would be an exact science. Mr. Wetherell concluded by saying that he owned a small farm, and if Prof. Stockbridge confirms his hypothesis, as stated, he should consider the value of his farm more than doubled.

Nathaniel T. Allen mentioned a visit which he paid to an exper-

imental agricultural school in Saxony and to the views of Prof. Nobbe, that eight or nine inorganic elements are required by plants. Prof. Nobbe had these elements prepared, and experimented in the growth of plants in distilled water with the addition of these substances, which mixture he termed "plant soup." A plant of buckwheat so treated grew ten feet high, and, at the time of his visit, had ripened eight hundred perfect seeds, which were afterwards increased to a thousand. Mr. Allen did not see why Prof. Nobbe had not accomplished just what Prof. Stockbridge claimed.

Prof. Stockbridge said that he was not acquainted with this experiment. Prof. Nobbe took a buckwheat plant and supplied it with every thing but soda, giving potash instead, to determine whether one mineral could take the place of another, and found that it could. This, however, does not injure the view that the composition of a plant is fixed by law, any more than the fact that a man can take a considerable quantity of arsenic without injury, by gradually increasing the doses, proves that arsenic is a wholesome food.

In reply to Mr. Wetherell's question, Prof. Stockbridge said that for all purposes of the farmer, considering all the circumstances of the plant and soil, barn-yard manure is the best, but if we consider only the feeding of plants, chemicals are just as good. We use barn-yard manure on our farms because we have it. Fish guano and all other waste materials which contain fertilizing elements, should be scrupulously saved and applied to the soil.

Mr. Wetherell said that the precise point he wished to ascertain is this: If chemicals will do just as well as barn-yard manure, why should a man who has none purchase it, when chemicals are just as good?

Prof. Stockbridge said that he should not, for chemicals would do just as well in feeding crops, and at less expense in handling.

The Chairman remarked that the close attention which had been given to the discussion for nearly two hours, showed the deep interest felt in the subject.

On motion of Mr. Wetherell, the thanks of the meeting were voted to Prof. Stockbridge for his very interesting lecture.

The Chairman announced that next Saturday the subject first assigned for this meeting, viz., "The Improvement and Ornamentation of Suburban and Country Roads," would be discussed.

MEETING FOR DISCUSSION.

SATURDAY, March 24, 1877.

The meeting was called to order by W. C. Strong, Chairman of the Committee on Publication and Discussion, who expressed the hope that none of the gardeners present would leave the room before the close of the discussion, as he thought it desirable that we should compare notes freely. Mr. Strong remarked on the great increase in the number of varieties of the rose forced in winter now, as compared with a few years ago, when the Safrano and Bon Silene were almost the only varieties used for that purpose, and he called for information as to the most desirable kinds.

Edwin Sheppard said that he had found the Comtesse de Serenye one of the best light colored Hybrid Perpetual roses for forcing.

C. M. Atkinson mentioned as among the best, Bessie Johnstone, President Thiers, Centifolia Rosea, and Elie Morel. Pierre Notting is very large, but requires more sun than we get at this season of the year. La Reine is an old variety and a very free bloomer; Mr. Atkinson had had a plant in an eight inch pot, with twenty-two flowers. The color has been called washy by some. Madam Lacharme is admirable for forcing, but does not stand well in summer. Captain Christy and La France are fine new kinds. Caroline de Sansal is third rate in comparison with many modern kinds. Baroness Rothschild is very popular, but a shy bloomer. In freedom of flowering none will compare with Gen. Jacqueminot—it has too many buds. Mr. Atkinson thought that the following named varieties would comprise the cream of the roses best adapted for forcing: Auguste Rigotard, Baroness Rothschild, Beauty of Waltham, Bessie Johnstone, Captain Christy, Centifolia Rosea, Claude Levet, Climbing Victor Verdier, Comtesse de Chabrillant, Comtesse d' Oxford, Cheshunt Hybrid, Duchess of Edinburgh, Dupuy-Jamain, Edouard Morren, Emilie Hausburg, Etienne Levet, John Hopper, Madame Hippolyte Jamain, Madame Lacharme, Madame Scipion Cochet, Madame Victor Verdier, Marquis de Castellane, Mademoiselle Eugenie Verdier, Monsieur Noman, Pierre Seletzsky, President Thiers, Richard Wallace, Paul Neron.

James Cartwright had not found Baroness Rothschild a shy

bloomer; he had had five or six buds on a cluster, and thought it the best light colored variety. It has but little fragrance. Hybrid Perpetual Boule de Neige he thought the best white he had ever seen. It is cup shaped, stands forcing well, and blooms well from spring to autumn, but not as well in winter, appearing to require more sun than we have at that season.

Mr. Sheppard had found Boule de Neige very satisfactory as far as he had tried it; it bloomed well in winter with him. Alfred Auber, a Hybrid Perpetual, is a very fine bloomer, of dark rose color, and very fragrant.

John B. Moore said that he had been surprised to see Boule de Neige growing freely in the border along with Tea roses at Mr. Tailby's. In his view the Baroness Rothschild was the best Hybrid Perpetual to force for market. He thought there were several kinds that bloom as freely as General Jacqueminot. The larger and more double a rose, the less the number of buds produced by it. Cheshunt Hybrid is a very free bloomer; he had had a young plant with fifty buds. Beauty of Waltham is a good rose and of good color.

Charles M. Hovey, remarked that La Reine is one of those productions, which, like the Bartlett and Seckel pears and the Baldwin apple, hold their popularity a long time. When he visited M. Laffay, the originator, at Meudon, in 1844, it was surpassed in form, size, or general beauty, by few varieties, and it still stands among the best. It can only be called washy in contrast to the dark varieties that we have run into of late.

Among the Teas there are many beautiful roses of but little, if any, value for the forcing house, except under certain conditions. Many of them remain closed in the bud and do not open freely. The less double sorts are the most valuable, but they must be cut very early to have them in perfection. General Jacqueminot does not stay long in the bud. Mr. Hovey agreed with Mr. Moore that size in roses is gained at the expense of quantity; the large flowered varieties are difficult to bloom, especially under a high temperature.

Mr. Sheppard, in answer to an inquiry from the Chair, said that he thought Maréchal Niel as profitable as any of the large roses. In a private place he would cultivate the large flowered varieties, but the smaller ones are more profitable for the florist.

Mr. Atkinson was called on to say something of a remarkably

fine specimen of spinach exhibited by him. The seed was sown the last week in August, and on the approach of winter the plants were covered with sedge. The winter was favorable to the keeping of the spinach because the snow came early. He had found that his seedling carnations, of which he had a large bed, came out in admirable order this spring. Feverfew passed safely through the winter and came into flower early. He used large quantities of pine needles for covering; their elasticity made them the best of all materials for covering herbaceous plants which carry their foliage over winter, such as hollyhocks, polyanthus, pansies, sweet williams, etc. He would not uncover so early as this without taking the precaution to cover again if cold, and would not uncover strawberries at all yet. He considered covering in autumn one of the most important points in gardening. He would use sedge in preference to the leaves of deciduous trees, which lie flat and cake together. Tritomas covered with the latter are sure to rot.

The Chairman expressed the opinion that oak and other broad leaves make a good covering. They are apt to blow away, and therefore should have some brush placed over them. If used too freely the plants under them will damp off. He thought the branches of evergreen trees preferable to pine needles, or indeed to any other covering. Stable manure is the worst covering that can be used for herbaceous plants.

John G. Barker, Chairman of the Committee on Plants and Flowers, called attention to a plant of *Aphelexis splendens*, exhibited by J. Warren Merrill.

Mr. Atkinson said that in the grand old days of the London Horticultural Society's exhibitions at Chiswick, this plant was exhibited by Mr. Cole, one of the best plant growers in England. He had seen a plant five feet in diameter, with hundreds of flowers. It should have a very porous soil, and needs silica, and therefore thrives best on peat and sand with plenty of crocks. It requires a somewhat dry atmosphere, and an intermediate house, where the lowest night temperature in winter would be from 35° to 40°. It is a native of the Cape of Good Hope. Other good varieties are *humilis* and *macrantha rosea*.

Mr. Hovey said that the plant is not new, but though introduced many years ago, it has not been seen here of late years. In this country it has been very little grown, and he was doubtful whether

it could be. The plant exhibited, though a small one, was a remarkably fine specimen. In England it has been exhibited at some of the great flower shows as one of twelve magnificent specimens, and in such a condition it is very beautiful, but there were only two or three cultivators who ever grew it so, and even there it has seldom been seen of late. It requires a peculiar temperature and a very dry atmosphere and proper soil; once overwatering will ruin it, and drying is equally hurtful. The treatment should be similar to that of heaths, but it is more difficult to cultivate.

James Cruickshanks said that in his younger days he was acquainted with two or three varieties, and it was then called *Helichrysum*. He knew of a case in which some plants were placed in the cool end of a pine stove, and others in the greenhouse; the latter did best and flowered strongest. He had seen very handsome specimens two feet high and a foot and a half across.

Mr. Atkinson did not agree with Mr. Hovey in regard to the limited extent to which it was cultivated in England. It was more or less cultivated in every collection, whole pits being devoted to it, and it was a common market garden plant. It is a ticklish thing to handle, but easy to grow with right treatment. He thought he could grow it successfully if he watered it himself, but not if everybody put on water from a hydrant.

Mr. Hovey said that one of the causes of failure with such plants as this is doubtless excessive watering from the hydrant. Mr. Cruickshanks had been at Mr. Pontey's, and seen the magnificent specimens grown there. Mr. Hovey had fine young plants many years ago, when they were put in charge of a skilful gardener, and were placed in a house with the azaleas, but they did not succeed—they would go back. We can grow two or three kinds of heath successfully, such as *caffra* and *densa*, but *Cavendishii* and others are much more difficult. Like them, the plant under consideration requires a place where the roots shall not be subjected to too great extremes of heat and moisture.

Mr. Cruickshanks said that the cause of failure was too little care in watering—if too dry the plants are ruined, and if too wet the roots will rot.

The Chairman thought that after so much had been said of the difficulty of growing this plant, many would be disposed to experiment and see just how difficult it is.

So much time had been consumed in the above discussion that it

was voted to postpone the consideration of the "Improvement and Ornamentation of Suburban and Country Roads," for another week.

MEETING FOR DISCUSSION.

SATURDAY, March 31, 1877.

W. C. Strong, Chairman of the Committee on Discussion, presiding. The Chairman remarked on the fine display of plants and flowers in the room, and called for any information that the members might have concerning them. As none was offered, the special assignment, the "Improvement and Ornamentation of Suburban and Country Roads," was taken up. This, the Chairman said, had been postponed, not because of its lack of interest, but because the objects exhibited on previous Saturdays could best be discussed while present before us. Travellers are struck with the excellence of the roads in England, and the park-like character of the scenery—not merely of the places set apart as public parks, but of the country generally. This arises in a great measure from the excellence of the roads, and the hedges by which they are bounded. We think there is no country like our own, but in many respects it is crude and unfinished, and this is especially true of our roads, the margins of which are often in a most untidy condition, even when the carriage way is well kept. The best means of ornamenting roads are not so well defined as the method of forming a good road-bed. In the city of Newton, where the speaker resides, there was talk of establishing a public park, but he thought there was a great work to be done first in the streets, which are now in a scandalous condition as regards neatness. Private ways in such a condition would be a disgrace to the owner, and care and attention should be given to this point before establishing a public park.

Aaron Davis Capen said that a fatal mistake in the ornamentation of streets, was in planting too many trees. As an example of too close planting he pointed to the trees in the cemetery opposite, standing so close as to be drawn up as in a forest. That is the way to plant if a forest is wanted, but not for ornament. He had noticed the planting of trees on the Common, when there were

already three or four times too many. Instead of buying more, he would take up a large proportion of those now growing. The case was similar with many of the ways laid out during the late period of inflation. He could point to trees set out twenty-five years ago, which are now all drawn up for want of room.

John B. Moore said that one of the first steps towards improving the appearance of our roads is to get rid of nuisances. By a recent act of the Legislature, authority is given to towns to pass by-laws, subject to the approval of the Superior Court, for this purpose. The town of Concord, where he resides, had passed such a by-law, and it is now the duty of the road commissioners to remove from the roadsides all piles of wood, manure, stones, rubbish, or other unsightly objects. The people generally have acquiesced in the law, and there has been no occasion for an appeal to the courts to enforce it. The residents in the village have cleaned up the brush, and mowed the grass by the roadsides. The speaker agreed with Mr. Capen that trees were frequently planted too close; he thought elms should be a hundred feet apart. The danger is that if they are planted too closely, with the idea of thinning out, it will not be done. As to thinning the trees on Boston Common, as Mr. Capen would do if he had the power, he would be hung in fifteen minutes after doing it. The speaker did not approve the action of the Society in regard to the Paddock elms, which were so much decayed as to be dangerous. People may like to see walls grown up to a solid hedge with wild shrubbery, but he regarded it as evidence of a poor farmer; it wastes his land and affords a harbor for skunks, woodchucks, and other vermin. He would ornament roads by planting trees or saving those standing, and did not like to see trees planted too regularly, but the first step must be the adoption of by-laws to prevent nuisances.

Leander Wetherell agreed in the main with Mr. Moore, and felt that the Society made a mistake in desiring to retain the Paddock elms. The trees on the Common would not all bear out the remarks which had been made in regard to crowding; some of those on Beacon street had long limbs, reaching nearly across the street, though planted near together. Mr. Wetherell spoke of the influence of trees in keeping roads wet, though perhaps such roads were not well made, and were not underdrained. Trees were sometimes removed on account of keeping the road wet. He spoke of cases where road-masters had ordered trees cut down for this reason. A

well built road might be planted with trees without becoming too wet. Mr. Wetherell alluded to the long and beautiful avenue of trees at Col. Russell's farm in Milton, planted a hundred years ago, and which surprised him by the taste displayed at that early day, and to the roads in Amherst, Northampton, Hatfield, and Sunderland, bordered with beautiful trees. Jenny Lind and other foreigners were attracted to Hatfield, summer after summer, by the beauty of the elms. Mr. Wetherell said that although there are objections to trees, he was not opposed to planting them, and it was delightful to pass through a street lined on both sides with rock maples, which tree he thought was surpassed by few for ornamental street planting. It succeeds better than the elm, and, though not as graceful, is clean and free from vermin in summer, and far more beautiful in its autumnal hues. Large quantities of sap for sugar making are in some places drawn from rock maple trees growing in the street. Mr. Wetherell spoke of the general formation of tree planting associations through the country, and agreed with Mr. Moore in regard to the good effect of the by-law mentioned by him. He would remove hedges from the roadside, especially the wild cherry trees, which form a harbor for caterpillars. The eye of a traveller is always attracted to a farm well cultivated inside, and with the road kept clean and neat outside, yet he regretted to see in New England so many good farms and farmhouses where the roadsides were covered with woodpiles, tools, timber, carriages, etc., lying and rotting, in a manner betokening the utmost slovenliness.

Rev. A. B. Muzzey said that the subject had many bearings, and one of the greatest obstacles in the way of bringing about the desired improvement is the prevalence of the utilitarian spirit. Our fathers, in the circumstances in which they were placed, could not lay out roads properly, and so we find them in the country located without reference to the principle of beauty, which, in its place, is just as important as utility. Roads should be laid out so as to produce a pleasing effect, but regard should also be had to accessibility. Roads were frequently made too narrow, and consequently large sums have been expended for widening them, in Cambridge, where Mr. Muzzey resides, and in other places. Trees should be planted in the right place, so that we shall not be obliged hereafter to cut them down or make the sidewalks with reference to the trees. The fertilization of trees in streets is often neglected, or misjudged as to the material used. The pruning is often

neglected or badly done. If they were pruned when young we should not only be saved much expense, but also much unsightly appearance, and sometimes the life of the tree. If we look at some of these little points we can make very great improvement at small expense.

The Chairman said, in regard to Mr. Moore's objection to hedges, that while they would be out of place in cultivated sections, there were many localities where they would be in harmony with the scenery, and produce a pleasing effect. It is true that the Paddock elms were not sightly trees, and so also the Old South Church is not a sightly building, but trees, as well as buildings, acquire a historical interest, and to cut them down is like showing disrespect to a venerable old man. There is a difficulty in removing unsightly objects from the roadsides, especially when, as is sometimes the case, cities and towns are themselves the greatest transgressors, and we have to educate the public to an appreciation of neatness. Stockbridge and Concord are towns where the streets are not only adorned with trees, but pride is taken in keeping them neat. The speaker condemned the custom of hoeing up the grass in the roads and gutters, as in those adjoining his own estate, where an army of laborers were employed in this work. He had obtained permission, and was removiug the clay and gravel from the gutters, and carting in loam, with the purpose of growing grass there and keeping it mown. Nature tries to hide blemishes in the landscape, and it is a disgrace to us if we fail to assist her. A gutter planted with grass will carry off the water on sloping ground without washing. There is generally no necessity for removing clay and gravel, as in his case, but the soil can be cultivated in grass by merely ploughing and seeding.

Mr. Moore said that there was an objection to grass in the gutters on level ground—the water would not run off freely—but where there is sufficient fall it will do.

Mr. Wetherell liked the Chairman's suggestion of grass in gutters, but doubted its practicability in many localities. He could ride for miles in many sections of the commonwealth where the ground was too rough to apply the plan. Some of the railroads in Canada have the sides of cuts made into terraces and grassed, and the road bed also is grassed, which has an excellent effect in preventing dust. Mr. Wetherell spoke of the width of highways, instancing the street at Old Hadley, which must be not far from twenty rods wide, affording ample opportunity for the adornment by

planting trees, which so characterizes the highways in the valley of the Connecticut.

Charles M. Hovey said that we should keep in mind the distinction between suburban and country roads. Back in the country, where there is not a house for miles, the roads are not mainly for the convenience of those who dwell on them, but for passers through. In these places there is not wealth enough, and perhaps never will be, to make such roads as the essayist suggests. When we come within the suburbs of cities we can expect more, but not often even then, in the style recommended. In a suburban residence one wishes to get away from brick sidewalks, and to have things as rural as possible without sacrifice of comfort and convenience. The question is, how to produce the most picturesque effect, without sacrificing these essentials. The roads in Brookline are bordered with grass and barberry bushes, and the grass is cut and the roads are kept in order by the proprietors. These make the pleasantest roads both for pedestrians and riders, but when we come to build up we lose this rural character and need something different. The speaker thought trees entirely out of place in city streets, unless very wide, — as much out of place as in a flower garden. The shade, insects, and falling leaves are often a great annoyance. They should be confined to boulevards, as they are in Paris, and to such places as our own Chester Park or Commonwealth Avenue. The beautiful lime trees in Charles street will soon be a nuisance. He disliked to destroy an old tree, and had erred in not cutting down trees which should have been removed. The treatment of roads must be governed by the character of the place, and the wealth of the people generally is not sufficient to admit of macadamized roads.

The Chairman remarked on the indications that the members of the Society were becoming interested in service in the field, and announced that this would close the series of meetings for discussion this season.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1877.

PART II.

BOSTON:
PRINTED FOR THE SOCIETY.
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TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, April 7, 1877.

A duly notified stated meeting was holden at 11 o'clock, President PARKMAN in the chair.

The Secretary announced an award to the Society by the Centennial Commission, for the Pears collected and exhibited by the Society at Philadelphia in September last, and a similar award for the Apples exhibited at the same time.

The Secretary also communicated an invitation from the Secretary of the New York Horticultural Society, to the members, to attend the exhibitions of that Society.

Adjourned to Saturday, May 5.

BUSINESS MEETING.

SATURDAY, May 5, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

No business being brought before the Society, it adjourned to Saturday, June 2.

BUSINESS MEETING.

SATURDAY, June 2, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The following named persons, having been recommended by the Executive Committee, were duly elected members of the Society:

Mrs. SAMUEL P. BURT, of New Bedford,
E. L. BEARD, of Cambridge,
HOWARD GRAY, of Boston.

Prof. GEORGE L. GOODALE, of Cambridge, was, upon recommendation of the Executive Committee, elected a Corresponding Member of the Society.

Marshall P. Wilder, after some remarks on the history and work of the American Pomological Society, moved the following vote, which was unanimously passed:

Voted, That the President appoint a delegation of twenty members of this Society, to attend the meeting of the American Pomological Society, at Baltimore, in September next, and that the delegation have liberty to add to their numbers, or appoint substitutes.

Meeting dissolved.

BUSINESS MEETING.

SATURDAY, July 7, 1877.

A duly notified stated meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

On recommendation of the Executive Committee, it was

Voted, To appropriate a sum not exceeding three hundred dollars, for the expenses of entertainments of the Committee of Arrangements for the current year.

The President, in accordance with the vote passed at the last meeting, reported the names of the following gentlemen as delegates to the meeting of the American Pomological Society :—

Marshall P. Wilder, Charles M. Hovey, William C. Strong, Thomas P. James, Charles O. Whitmore, E. W. Buswell, Robert Manning, Hervey Davis, John B. Moore, Benjamin G. Smith, J. W. Manning, James W. Clark, William Parsons, Henry F. French, William H. Spooner, B. K. Bliss, Lemuel Clapp, E. L. Sturtevant, Aaron D. Capen, Frank Andrews.

On motion it was voted that James F. C. Hyde, E. W. Wood, and C. H. B. Breck, be added to the delegation.

William Falconer, of Cambridge, being recommended by the Executive Committee, was duly elected a member of the Society.

Adjourned to Saturday, August 4.

BUSINESS MEETING.

Saturday, August 4, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President Parkman in the chair.

Agreeably to the Constitution and By-Laws, the President appointed the following named members a Committee to nominate suitable candidates for officers of the Society for the ensuing year :— Charles O. Whitmore, William C. Strong, John G. Barker, John C. Hovey, Patrick Norton, Charles H. B. Breck, and James Cruickshanks.

Marshall P. Wilder, in some appropriate remarks on the services to the Society of Mrs. Harriet S. Buswell, moved the appointment of a committee to present memorial resolutions. The motion was unanimously carried, and Marshall P. Wilder, Charles O. Whitmore, and Charles M. Hovey, were appointed that Committee.

Adjourned to Saturday, September 1st.

BUSINESS MEETING.

SATURDAY, September 1st, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, Vice President WHITMORE in the chair.

On recommendation of the Executive Committee, SAMUEL H. SCUDDER, of Cambridge, was duly elected a member of the Society, and JOHN JAY SMITH, of Germantown, Pa., a Corresponding Member.

Marshall P. Wilder, Chairman of the Committee to present resolutions on the death of Mrs. Buswell, reported the following:—

Resolved, That in the removal of Mrs. Harriet S. Buswell, by death, the members of this Society have lost a lady whose welcome presence was always with us; whose pleasant address, cordial greeting, courtesy and social qualities, and interest in the welfare of our institution, will ever be highly appreciated and kept in mind by the members of this Society, and a large circle of mourning friends.

Resolved, That the above resolution be entered on our records, and that a copy be furnished to Mr. E. W. Buswell, her surviving partner, as expressive of the sympathy of our members in his afflictive bereavement.

The resolutions were seconded by Robert Manning; remarks were made by James Cruickshanks and Charles M. Hovey, and the resolutions were unanimously passed.

The presiding officer read the following letter, addressed to him as Chairman of the Nominating Committee:

BOSTON, 15th August, 1877.

C. O. WHITMORE, ESQ.:

Dear Sir:

With reluctance and regret I beg to say that I am compelled by other engagements to decline again to stand as a candidate for the office of President of the Society, which it has been my privilege and honor to hold for the past three years.

Respectfully yours,

F. PARKMAN.

The Chairman then presented the report of the Nominating Committee, which was read by the Secretary and accepted by the Society.

Marshall P. Wilder, mentioned the arrangements which had been made for the accommodation of delegates to the Pomological Society.

Meeting dissolved.

BUSINESS MEETING.

SATURDAY, October 6, 1877.

A stated meeting of the Society, being the annual meeting for the choice of officers, was holden at 11 o'clock, Vice President WHITMORE in the chair.

The Recording Secretary stated that due notice of the meeting had been given in accordance with the Constitution and By-Laws.

On motion, it was voted to proceed to the election of officers.

The chair appointed Benjamin G. Smith, E. W. Buswell, and John C. Hovey, a Committee to receive, assort, and count the votes given, and report the number.

Voted, That the polls remain open one hour and that the check list be used.

The polls were opened at ten minutes past eleven o'clock.

The Secretary announced the receipt of the Diplomas and Medal awarded to the Society by the United States Centennial Commission, and presented the same.

The polls were closed at ten minutes past twelve. The Committee to count the votes presented their report, which was accepted, and the Chairman of the meeting, in accordance with the Constitution and By-Laws, declared the persons named in the report to be elected officers and committees of the Society for the year 1878.

Adjourned to Saturday, November 3.

BUSINESS MEETING.

SATURDAY, November 3, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The President, as Chairman of the Executive Committee, reported a recommendation that the following named sums be appropriated for the year 1878:

For Prizes, ...	$4,575 00
" the Library Committee, . . .	225 00
" the Committee on Publication and Discussion, ...	200 00
" a portrait or bust of the President elect,	200 00

The President reported the following further action of the Executive Committee:—

Voted, That the Executive Committee recommend to the Finance Committee that the unexpended balances of the appropriations for the Library, for the years 1875 and 1876, including that of $600 for the "Flora Danica," be recognized by the Finance Committee.

Voted, To recommend to the Society the passage of the following vote: *Voted*, That the recent action of the Executive Committee, in the application of unexpended balances of appropriations to the Library, in the years 1875 and 1876, shall not be taken as a precedent, but that all unexpended balances of appropriations for any year, after the payment of all bills contracted in that year, shall revert to the Treasury at the close of the year.

The vote recommended by the Executive Committee was unanimously passed.

The following named gentlemen, having been recommended by the Executive Committee, were on ballot, duly elected members of the Society:

Rev. Crawford Nightingale, of Dorchester,
Warren Fenno, of Revere,
M. H. Norton, of Boston,
Daniel Duffley, of Brookline,
William D. Park, of Boston.

The following vote, offered by C. M. Atkinson, was unanimously passed:

Voted, That the report of the Treasurer shall show, in separate items, all expenses incurred of ten dollars and upwards.

Adjourned to Saturday, December 1.

BUSINESS MEETING.

SATURDAY, December 1, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The President announced as the first business before the meeting, resolutions in memory of Thomas Rivers, one of the most eminent European horticulturists and pomologists, which would be appropriately presented by Marshall P. Wilder, the foremost American pomologist.

Mr. Wilder thanked the President for suspending the usual order of business that we might render proper honor to the memory of one of the oldest and most respected corresponding members of the Society. He was advised by the memorial card which he held in his hand, that Thomas Rivers died at his residence, Sawbridgeworth, England, on the 17th of October, 1877, aged seventy-nine years. It had been his privilege for nearly fifty years to be acquainted by correspondence or personally, with Mr. Rivers, who was one of the most eminent horticulturists of the age. As a nurseryman, pomologist, tree and rose grower, and especially as a hybridizer, producing and disseminating new and choice varieties of fruits and flowers the name of Mr. Rivers would long be remembered with veneration and gratitude. For nearly sixty years he was actively engaged in the nursery business, and it can be said with truth, that no man in all Europe ever maintained a higher character for fidelity and integrity. As a pomologist he would be remembered for generations to come, especially for the production of new and valuable fruits from seed, which exercised a fascination over him; as he said "growing with his growth and strengthening with his decline." As a raiser and introducer of new fruits, the editor of the London "Gardener's Chronicle," (than which there can be no higher authority), said of him, "the name of Thomas Rivers stands pre-eminent. We have had no English pomologist to compare with him in this department, if we except Thomas Andrew Knight." The same paper gave a list of more than seventy new varieties of fruits raised and sent out by him. Mr. Rivers considered as one of his greatest triumphs, the production of early peaches, by which the season is extended for several weeks, and

which are now distributed throughout the fruit growing world. As a lover of the rose, and the great leader in its improvement in England, his name will be embalmed in the hearts of grateful millions, while the rose shall unfold its petals to the morning light, or shed its fragrance on the passing breeze. Of his love and devotion to the rose, it has been remarked that "Age cannot wither his loyalty, and beneath a hundred medals, orders, and clasps, his brave heart is still with the rose." His catalogue of roses, published forty-four years ago, was pronounced by Mr. Loudon the most useful one in the English language.

Besides writing many excellent practical works on horticulture, Mr. Rivers had been for many years a large contributor to the periodical press, and his various books and papers on the rose, the pear, root pruning, double grafting, the construction of orchard-houses and other cheap protections against the uncertainties of an English climate, and on other subjects, are among the most valuable contributions to horticultural literature.

Mr. Wilder said that time would fail him, were he to attempt to enumerate the various ways in which Mr. Rivers' name has been associated with the progress of rural economy and the horticulture of the world. Truly it might be said of him, "His works do follow him." His books are the best record of his life.

Mr. Wilder closed by presenting the following resolutions: —

Resolved, That in the death of Thomas Rivers, one of the oldest and most respected corresponding members of this Society, we recognize, in common with the horticultural world, the loss of a friend of horticultural science, rural improvement, and ornamental culture, and a benefactor to our race.

Resolved, That while we deplore the loss of so useful a man, we desire to thank the Supreme Disposer of all events that he was spared to us for so long a course of years, and was at last gathered to his fathers "like a shock of corn fully ripe in its season."

Resolved, That the members of this Society sympathize sincerely with the bereaved family in their affliction, and that a copy of these proceedings be forwarded to Mrs. Rivers as a token of the respect and esteem in which her late husband was held in America.

William C. Strong testified to the sense of obligation which he, in common with other horticulturists, felt to Mr. Rivers for his many suggestive and successful experiments, especially in the construction of cheap orchard-houses.

James Cruickshanks spoke of visiting Mr. Rivers and seeing his extensive nurseries, and meeting with kindness and attention more than could be expected or expressed.

President Parkman said that his first introduction to a knowledge of the rose was through Mr. Rivers' book, in which he had recorded his ample experience in the culture of that flower. The book is full of the honest enthusiasm of his character, which here found expression in regard to the rose. At the time it was written, Mr. Rivers was more prominent in rose culture than any other Englishman, and with its progress he stood at least equal to any one who has written on the subject. He afterwards wrote on orchard-houses, and a passage in the preface to his work on this subject, in which he dedicated the profits resulting from it to the repair of the parish church in which his family had worshipped for generations, showed the quality of the man. Although the speaker had no personal acquaintance with Mr. Rivers he felt, in common with all horticulturists, that we had lost one of our leaders.

The resolutions were seconded by Robert Manning, and were unanimously passed.

W. C. Strong, Chairman of the Committee on Publication and Discussion, read the Annual Report of that Committee.

Waldo O. Ross, Chairman of the Library Committee, read the Annual Report of that Committee.

J. H. Woodford, Chairman of the Garden Committee, read the Annual Report of that Committee.

Benjamin G. Smith, of the Committee on Fruits, read the Annual Report of that Committee.

The above mentioned reports were severally accepted and referred to the Committee on Publication.

Hervey Davis, Chairman of the Fruit Committee, called the attention of the Society to the recommendation in the report of that Committee, that the Prospective Prize of sixty dollars, for the best Seedling Hardy Grape, be awarded to John B. Moore, for the Moore's Early.

It was moved by John G. Barker and seconded by James Cruickshanks, that the recommendation of the Fruit Committee be approved by the Society.

N. B. White moved that the award be postponed for one year.

The vote passed January 13, 1877, relative to Prospective Prizes,

was read, and the subject was discussed. Remarks were made by John C. Hovey, E. W. Wood, W. C. Strong, N. B. White, and B. G. Smith. Mr. White's amendment was rejected, and the motion to approve the recommendation of the Fruit Committee, passed in the affirmative.

John G. Barker, Chairman of the Committee on Plants and Flowers, read the Annual Report of that Committee.

Charles N. Brackett, Chairman of the Committee on Vegetables, read the Annual Report of that Committee.

Robert Manning, Secretary, read his Annual Report.

These reports were severally accepted and referred to the Committee on Publication.

The President, as Chairman of the Executive Committee, reported the list of prizes to be offered for the year 1878.

Further time was granted to the Committee of Arrangements to present their report.

On motion of N. B. White, it was

Voted, That all Prospective Prizes shall be awarded only to the originators of the productions for which such prizes are offered.

Meeting dissolved.

REPORTS.

REPORT

OF THE

COMMITTEE ON PLANTS AND FLOWERS,

FOR THE YEAR 1877.

By JOHN G. BARKER, CHAIRMAN.

The closing year again reminds us of our duty to report our doings for the past season, and it is with great pleasure that we can say to the Society that this department has been well sustained through the entire year. The interest in the impromptu exhibitions seems to increase with each season, some of Flora's choicest productions having been presented at these shows. The Rhododendron Show, although the contributions were not as large as in previous seasons, was one of the very best ever held by the Society, the splendid stands of new and choice varieties from H. H. Hunnewell being by far the best ever exhibited. The Rose Show was a grand success and gave great satisfaction to all, both visitors and contributors, and it is very gratifying that so many sent their contributions, adding much more to its interest than if the whole show were made up and all the prizes taken by a few contributors. There are a great many roses grown in this vicinity, and by skilful growers, and there is no reason why this should not be one of the best, if not the very best, show of the season. The weekly exhibitions have been well attended, and the contributions kept up to a good standard. The Annual Exhibition, as we all know, was one of the very best ever held; at no time have the plants been any better, and the superb specimens from H. H. Hunnewell have never been equalled. The prizes were nearly all competed for, thus showing a lively interest in the exhibition. The Chrysanthemum Show has taken its place among the best, as the

last fully proved. We have been permitted to welcome all our old or regular contributors, with the addition of some new ones.

Cyclamens.—There are but very few plants that will pay the cultivator better for his time and trouble than the cyclamen. As a decorative plant for both the conservatory and the window it is one of the most desirable, and as a florist's flower it is equally good, as the flowers can be used to very great advantage, and with care may be had from Christmas to May. The plants exhibited the past season have been exceedingly good. The exhibitors were James O'Brien and C. B. Gardiner. Particularly noticeable were the superb specimens shown by Mr. Gardiner on the 3d of March. The large plants which attracted so much attention were five years old from the seed, the largest measuring eighteen and one-half inches in circumference. Mr. Gardiner informs us that he has picked from it in the seasons of 1875 and 1876 an average of three hundred and eighteen blossoms, and it appears to have full as many this season. Indeed all the plants exhibited at this time were the best ever shown, each one being a mass of beautiful foliage with well shaped, richly colored flowers, and although all were not quite as large as the one mentioned, they must have had at least from one hundred and fifty to two hundred blossoms on each plant. Mr. Gardiner's mode of cultivation is to dry them off entirely during the summer and place them under the benches in the greenhouse. The compost used is good garden soil, muck, and leaf mould, in equal parts, with a little sand. Mr. Gardiner uses no liquid manure of any kind and grows them in a temperature of from 40° to 50°.

Camellias.—The only exhibitors were Hovey & Co., who on the 3d of March made a very fine display of named varieties, and showed also a handsomely arranged basket of the beautiful seedlings of which mention was made in a previous report.

Orchids.—Although not exhibited in as large numbers as in some previous seasons, good plants have been shown by C. M. Atkinson, of *Phaius grandifolius* (*Bletia Tankervilliæ*), which Mr. Williams in his "Orchid Grower's Manual" describes as a noble evergreen plant from China, growing three feet high, and producing its flower spikes one or two feet above the foliage, the color of the flowers being white and brown; they bloom during the winter and spring months, and last long in beauty if in a cool house. This is a most useful plant for winter blooming, and, when well grown, a noble plant for exhibition.

From E. S. Rand, Jr., came, on the 3d of March, three varieties of winter blooming orchids, viz. :—

Cypripedium hirsutissimum, a rare and beautiful Indian species, which when in bloom will last for several weeks in perfection. The plant shown was the first ever exhibited here, and was a good specimen.

Cypripedium villosum was also a well grown and well bloomed plant. Foliage long, light green; flowers very large, and like those of *C. hirsutissimum* will last for weeks in perfection. It is one of the best of the genus.

Epidendrum ellipticum.—While not a large flowering variety, this is very gay and always in bloom; the plant was a good specimen.

Mr. Rand also exhibited *Cypripedium Dayanum*, a native of Borneo. A fine strong growing species, of the *barbatum* type, with beautiful mottled foliage.

James Cartwright presented the following:

Calanthe Veitchii—a small plant of this beautiful species. On large plants the flower spikes are frequently eighteen inches high; and the blossoms of a rich rose color. It is one of the best for winter decoration.

Cattleya crispa, a very fine free growing orchid from Brazil; the color of the flowers is very attractive, and it is worthy of a place in every collection. It is also known by the name of *Lælia crispa*.

Dendrobium thyrsiflorum, a very showy species, of the habit of *D. densiflorum*, but of stronger growth; the flowers are golden and white and are produced in beautiful clusters.

At the special exhibition of summer flowering varieties on the 21st of July, Mr. Cartwright exhibited the three varieties named below.

Cattleya Loddigesii, a beautiful flowering variety from Brazil; sepals and petals of a pale rose color, tinged with lilac; the lip a light rose, marked with yellow.

Cypripedium niveum, a native of Siam. A very dwarf plant; foliage dark green, with minute white spots; purplish red below; flowers porcelain white, spotted with violet purple.

Phalænopsis amabilis.—One of the handsomest of the genus, of which the species are few. The plant is of medium growth and produces very beautiful flowers which last a long time in perfection. The flowers are borne on very graceful spikes and are arranged in two rows down the spike. The sepals and petals and lip are pure

white; the inside of the flower is marked with rosy pink. This variety is a native of Manilla and is very properly called the "Queen of Orchids."

W. J. Vass has exhibited small specimens of *Brassavola glauca*, *Oncidium bicallosum*, *Phaius grandifolius*, *Cypripedium barbatum*, *Brassia verrucosa* and *Lælia purpurata*, all well known varieties, which can be found fully described in any of the books on orchids in the library.

From William Gray, 3d, we had *Cypripedium longifolium*—not as showy as many of the species, but desirable on account of its being in bloom nearly all the time.

From William Gray, Jr., came the following:

Cypripedium barbatum superbum, which Williams, in his "Manual," describes as a fine variety, growing in the same way as *barbatum*, but with the foliage more variegated, and the flowers handsomer, the lip being very dark, and the upper petal having more white; it will last about six weeks in perfection. This makes a fine plant for exhibition.

Cypripedium biflorum, from Mt. Ophir. One of the *barbatum* group, and by some considered only a variety of that species. The flowers are very bright in color, and last a long time in perfection.

F. L. Ames exhibited the two following:

Cypripedium Parishii.—A species of stately growth, with broad, coriaceous, dull green foliage; flowers greenish white and purple, not showy but very enduring. A strong plant of this species will be seldom out of bloom.

Cypripedium Dominianum.—A fine hybrid raised between *C. caricinum* and *C. caudatum*, by Mr. Dominy, in compliment to whom it has been named by Professor Reichenbach. In habit the plant most resembles *C. caricinum*, but the flowers are much larger and brighter colored. The petals remind one of similar appendages in *C. caudatum*, but they are twisted spirally like those of *C. caricinum*. The flowers, which are produced two or three together on tall scapes, are of a greenish yellow color, shaded with reddish brown and spotted with purple. The staminode and the basal portions of the petals are densely set with stiff hairs. It is the first time it has been exhibited.

From Edward Butler came two fine specimen plants of *Calanthe vestita rubra* and *C. vestita alba*, which were two of the best specimens of *Calanthes* ever shown. The *Calanthes* are very beautiful,

and exceedingly useful as winter blooming kinds; they are easily grown, and the flowers are very durable; a collection of orchids is hardly complete without them.

SPRING FLOWERING BULBS.—The very liberal premiums offered for the past two years in this direction have failed to draw out the competition hoped for. The exhibitors of Hyacinths were C. M. Atkinson and Hovey & Co., each of whom showed very fair specimens. Of Narcissus, Hovey & Co. were the only exhibitors. For Tulips, Jonquils, and Lily of the Valley, there was no competition.

INDIAN AZALEAS.—The special exhibition occurred on the 7th of April, and although there were good plants shown, as a whole they were not up to the standard of former years. The exhibitors were Hovey & Co., Marshall P. Wilder, and C. M. Atkinson. The best six were from Hovey & Co., the varieties being Madame Leon Maenhaut, Guillaume III., Gloire Avant Tout, Madame Louise Van Houtte, Fimbriata Alba, and Flag of Truce. Besides the above, the Messrs. Hovey exhibited many fine varieties from their large collection.

From Marshall P. Wilder, whose enthusiasm as a grower and producer of this beautiful flower knows no bounds, we note the following fine varieties, and append descriptions, as far as we can obtain them, of the rarer ones:

Argus (new).

Baron de Vrière.—Salmon rose, margin white.

Bijou de Paris.—White ribbonned with rose and salmon.

Charmer.—Bright amaranth, good form, and petals of great substance.

Countess of Beaufort.

Gloire de Belgique.—White, striped with rose.

Harlequin.

Jean Van Geert.

John Gould Veitch (new).

Juliette.

Madame Glorner.

Mlle. Louise de Kerchove.

Mrs. Wright.

Philadelphia.

Prince Albert.—Large flower, fine scarlet.

Princess Louise.

Rhenania.—Rosy carmine, beautifully spotted.

Sigismund Rucker.
Vuurwerk.

From John B. Moore came good specimen plants of the following fine varieties, all in the best possible condition; the flowers large and fine, the foliage healthy and handsomely intermixed with the flowers:

Carl Enke.—Bright rose edged with white.
Decora.
Dieudonné Spae.—Rose, bordered with white and striped with carmine; a fine plant.
Etendard de Flandre.
Flag of Truce.
François de Vos.
Juliana.
Madame Iris Lefebvre.
Marie Lefebvre.
Marie Vervaene.
Vesuvius.

Special attention was directed to a group of seedlings from Marshall P. Wilder, exhibited on the 24th of February. The plants were small, being about eighteen inches high; the flowers were good, but no better than many well known varieties; they were but three years from seed, the principal point being that they were brought into flower in so short a time from the sowing of the seed. As soon as the seedlings were large enough they were grafted on strong growing stocks, by which process they were brought to flower much earlier than if left on their own roots, saving much time in waiting for the result of the producer's labors.

Cinerarias.—It was the unanimous opinion of the Committee that the plants shown by J. Warren Merrill on the 17th of February were the best that have been exhibited for the past ten years. The Cineraria in its improved condition is indispensable in any collection of greenhouse plants; there are very few if any plants so gay and beautiful during the winter months, so that it is highly useful both for exhibition and decorative purposes. The plants, both as to variety of color and good cultivation, were all that could be desired. We hope that the success attained by Mr. Merrill will stimulate others to go and do likewise.

Polyanthus.—The only exhibitor was C. M. Atkinson, who showed six well grown plants. This is an old but too much

neglected flower, and deserves more general cultivation and better treatment than it generally receives. In England, considerable attention is paid to its cultivation. It is one of the earliest spring flowering plants, and will well repay the attention that it requires for successful cultivation.

VIOLETS.—Six good plants in pots were shown by C. M. Atkinson on the 3d of March; the variety was Marie Louise, and the flowers were very large and fine.

AMARYLLIS.—There was no competition for the premiums offered in April, but A. McLaren exhibited two good seedlings on the 17th of February, and on the 28th of July another which promises to be a good acquisition; the flower large, color bright scarlet with fine white markings through the centre of each petal. From J. B. Moore we had cut flowers of well known varieties. From Francis Putnam very good exhibitions of seedlings which were well worthy a place in any collection.

PELARGONIUMS.—This exhibition which was held on the 5th of May was not a success, and but very few of the liberal premiums offered by the Society were awarded, and what plants were shown, with perhaps one or two exceptions, were not worthy of any special note. It would seem that with so many florists and amateurs who have fine collections of Pelargoniums as there are in this vicinity, this should be one of the best instead of one of the poorest exhibitions of the Society.

SHOW and FANCY PELARGONIUMS.—For these there was no competition, the principal reason being, perhaps, that the time the premiums were offered (June 2d), was at least one month too late.

CALCEOLARIAS.—Six fine plants were shown by C. M. Atkinson, which were masses of beautiful flowers and were very ornamental.

TULIPS.—A good stand of twenty-five named varieties was shown by C. M. Atkinson, he being the only exhibitor.

HARDY SHRUBS were shown by Hovey & Co., Miss S. W. Story, and Miss A. C. Kenrick. There was nothing new or remarkable in these collections, but each was made up of a good selection of well known standard varieties.

RHODODENDRONS.—June 2d being the special prize day, very excellent collections were shown by H. H. Hunnewell and C. M. Atkinson, and a smaller collection of good varieties from E. Shepherd. Again on the 9th of June, a very superb collection of new and rare rhododendrons was shown by H. H. Hunnewell. Though

many superb collections have been exhibited by Mr. Hunnewell, we feel that we are safe in saying this has never been equalled. Francis B. Hayes also exhibited a small collection. In our last report may be found a carefully prepared list of choice varieties, which we think will be of use to any one about making a collection of rhododendrons.

Hardy Azaleas were shown by Hovey & Co., E. Shepherd, and B. G. Smith, each exhibiting a good collection of choice varieties. We append a list of the ten varieties exhibited by B. G. Smith, which were very fine and showed good care in their selection. No other lists were handed the committee.

Baron Pycke.—Large, orange.
Coccinea.—True scarlet.
Cruenta.—Scarlet, fine.
Gloire de Belgique.
Graf von Méran plena.—Fine rose.
Narcissiflora.—Splendid yellow.
Ne plus ultra.—Extra orange.
Othello.
Princeps speciosa.
Prince Frederick.

The hardy Azalea deserves more general cultivation than it now receives. There is no hardy plant that requires less care; it will flourish well in any good garden soil. The plants may be massed with other shrubs, but produce the best effect in groups by themselves on the lawn. If planted in a partially shaded place the flowers will last much longer in perfection.

Roses.—The plants in pots and the cut flowers shown from time to time have been among the very best contributions placed upon the Society's tables; and for the past two or three years, the annual rose shows have steadily improved. Your Committee thought that the show of 1876 could hardly be equalled, but that of 1877 far exceeded our most sanguine expectations. At the Rose Show held June 20th, William Gray, Jr., exhibited the following new varieties sent out since 1873:

Antoine Mouton.—Fine orange rose; very large, full and fine.

Madame Lacharme.—Very vigorous; flowers very large, full, beautifully formed; while opening slightly shaded with rose in the centre, changing into pure white; a superb rose.

Madame Marius Cote.—Flowers clear red, passing to deep rose; cup shaped; very large, full, fine form; growth very vigorous.

Mrs. Veitch.—Bright rose, streaked with white; free flowering, very vigorous.

Souvenir de Spa.—Flowers large; full and very finely formed; color deep red, with fiery reflex.

Star of Waltham.—Bright pink; good shape; large and full.

For the best twelve varieties the competitors were C. M. Atkinson and Francis Parkman; the collection receiving the first prize contained the following fine varieties:

Baron Adolphe de Rothschild.—Bright red; large, full; fine foliage.

Captain Christy.—Flowers very delicate flesh color, deeper in the centre; very effective, large flower; vigorous.

Charles Lefebvre.—Fine brilliant velvet crimson; large, cupped; considered one of the finest roses in cultivation.

Comtesse d'Oxford.—Bright carmine red; large and full, fine form; a splendid rose.

Etienne Dupuy.—Flowers large, full, well formed; color, bright silvery rose.

François Michelon.—Deep rose, reverse of petals silvery; large, full and globular in form.

John Harrison.—Brilliant deep crimson, shaded velvety black; very effective; a vigorous grower.

Madame Louis Leveque.—Fine, bright, clear rose; very large, full, and globular; imbricated.

Madame Marie Finger.—Bright flesh-colored rose, deeper in the centre; globular form; large.

Paul Neron.—Dark rose; fine form, large and full.

Perfection de Lyon.—Color, bright rose, reverse of the petals lilac; form cupped, large and full.

Of the best six distinct named varieties the exhibitors were William Gray, Jr., Francis Parkman, and John B. Moore. We are not able to give any lists of the six varieties, as none were handed to the Committee.

For the best three named varieties, William Gray, Jr. and John B. Moore were the competitors; the best three were Madame Schwartz, Duc de Morny, and Monsieur Boncenne; the last named is violet crimson, richly shaded; large and full.

Moss Roses.—The only exhibitor was W. H. Spooner, Jr., who showed a very fine stand of choice varieties.

Tender Roses.—In this class James Comley was the successful competitor; his collection contained the following varieties:

Bon Silene,	Niphetos,
Duchess of Edinburgh,	Paul Labonté,
Isabella Sprunt,	Perle de Lyon,
Madame Harriveaux,	Souvenir de Malmaison,
Marechal Niel,	Souvenir de Paul Neron,
Mlle. Marie Berton,	Yellow Tea,

the descriptions of which may be found in any of the leading catalogues.

For twelve Marechal Niel roses, M. D. Spaulding exhibited a good stand, and for twelve of any other sort a very fine stand of Souvenir de Malmaison was shown by James Comley.

In the general display excellent stands were shown by J. S. Richards and E. W. Wood; these were two of the best general displays ever made.

Special Prizes.—The competition for these prizes was very satisfactory. For the best twelve of any one variety the premium was awarded for a stand of Alfred Colomb, a bright fiery red rose; large and full, very effective, and one of the best roses in cultivation.

For the best six of any one variety the premium was awarded for a stand of Louis Van Houtte. The flowers are reddish scarlet and amaranth, shaded with bluish purple; very large and full; a splendid rose.

For the best twelve named varieties the premium was awarded to Francis Parkman for a stand containing the following superb varieties:

Alfred Colomb,	Leopold Premier,
Caroline de Sansal,	Madame Boncenne,
Charles Lefebvre,	Madame C. Crapelet,
Comtesse d'Oxford,	Madame Victor Verdier,
Etienne Levet,	Marquise de Castellane,
Felix Genero,	Paul Neron.

For the best six named varieties the premium was awarded to J. C. Chaffin. The varieties were Baronne de Rothschild, Fisher Holmes, François Michelon, Madame C. Crapelet, Mlle. Bonnaire, and Prince Camille de Rohan.

Besides those shown at the annual rose show, there was exhibited by James Comley, on the 24th of January, a fine lot of cut flowers of Tea roses; also a new Hybrid Perpetual rose, Gustave Revilliod,

a beautiful, satiny pæony rose, large, full and imbricated; and by M. H. Merriam, a good plant of Anna de Diesbach.

March 3d being prize day for Hybrid Perpetual roses in pots, two good collections were exhibited by John B. Moore. Again on the 10th of March, Mr. Moore showed a collection of six varieties in pots; they were Baronne de Rothschild, Captain Lamure, Cheshunt Hybrid, Mademoiselle Eugene Verdier, Marquise de Castellane, and Paul Verdier. It is due to Mr. Moore to say that the plants exhibited by him were the best grown roses in pots ever exhibited, and gave good evidence that they had been grown by skilful hands; the foliage was very large and healthy, and the flowers as near perfection as any one ought to expect.

James Comley has made a fine display of new and other Tea roses; among them we note, besides well known varieties, the following, as new and desirable:

Charles Rovolli.—New.

Duchess of Edinburgh.

Jean Ducher.—Salmon yellow, shaded rose peach; globular, full; extra fine.

Letty Coles.—New.

Mad. Miolan Carvalho.—New.

Marquis de Sanima.—New.

Perle des Jardins.—Straw color; very fine and very desirable; one of the best.

Souvenir de Mad. Pernet.—New. Fine light rose, shaded clear yellow, very effective in color; large, globular form; first class.

C. M. Atkinson also exhibited on the 30th of March and the 7th of April, very good collections of roses in pots, which were well grown plants; among them we noticed the following varieties: Beauty of Waltham, Countess of Oxford, Edward Morren, Marquise de Castellane, Monsieur Pierre Seletszki, and Monsieur Hippolyte Jamain.

Gloxinias.—We regret to again report that there was no competition for the prizes offered for this beautiful flower, which for summer decoration for the greenhouse and conservatory has scarcely an equal. From the ease with which it is cultivated, and the large quantity grown in this vicinity by both amateurs and florists, it would seem that the competition for Gloxinias should be very spirited, but the only ones exhibited at any time were some fine cut flowers

from J. B. Moore, and plants in pots from Marshall P. Wilder on the 2d of June.

WARDIAN CASES were shown by D. R. Beckford, Jr., Hovey & Co., and Carl Deeterich, which were all well filled, and were fine ornaments for any room, but your Committee think that with some of them too much attention was given to elaborate wood-work; so much, as was remarked in our last report, as to distract attention from the plants. The main attraction ought to be the plants in the case, and not the case outside the plants, although that should be neatly made.

FERN CASE.—W. H. Halliday exhibited a very pretty one for a table; also a hanging Fern Case; both were nicely filled with plants in excellent condition, and were worthy a place in any room.

HERBACEOUS PÆONIES.—There was only one small collection exhibited, and these could not be ranked as first class. From Hovey & Co. there were some very fine specimens of Richardson's Seedlings which have been fully mentioned in previous reports, and well sustain the character given them as valuable additions to this handsome species of herbaceous plants.

SWEET WILLIAMS.—James Nugent and Harry L. Rand were the exhibitors, with two very good stands. This popular flower deserves a place in every garden; any one can grow it, and it always gives satisfaction. Some of the auricula flowered varieties are very fine.

NATIVE PLANTS have been exhibited in larger quantities than for several seasons past.

Among the many exhibited by George E. Davenport, most noticeable was a plant of *Vittaria lineata*, a grass like fern growing on trees, from Florida; three varieties of *Trillium*, viz., *T. erectum*, *T. grandiflorum*, and *T. recurvatum*—the last exhibited in 1876 under the name of *T. sessile*, but has proved to be *T. recurvatum;* also, *Cypripedium arietinum* (Ram's Head Cypripedium), *Cypripedium candidum* (Small White Lady's Slipper); *C. parviflorum* (Small Yellow Lady's Slipper); *C. pubescens* (Larger Yellow Lady's Slipper). Again on the 4th of August Mr. Davenport exhibited a very nice collection, all neatly arranged and named. Also, on the 8th of September, *Paronychia argyrocoma* (Silver Chickweed); *Gerardia tenuifolia*, var. *alba* (Slender Gerardia), which is the first time these two have been shown; and *Eupatorium aromaticum*, a very pretty species with a small corymb of large,

white, aromatic flowers. Mr. Davenport has shown many other well known varieties, all named, and adding to the interest of the exhibitions.

E. H. Hitchings exhibited a very fine specimen of *Hottonia inflata* (Water Violet); a single flower of *Lilium Canadense* having five petals of pure yellow without spots; *Habenaria ciliaris*, (Yellow Fringed Orchis), "our handsomest species;" *Sagittaria gracilis* (Pursh), *Eupatorium teucrifolium*, and other rare species. Mr. Hitchings has not exhibited in as large quantities as in previous seasons, but what has been lacking in quantity has been fully made up in quality; his exhibits have been only of the rarest and choicest varieties.

Mrs. C. N. S. Horner, as in previous seasons, has faithfully performed her part in making this department of the exhibitions successful, having taken the first premium at most of the exhibitions of native flowers.

We have also been permitted to welcome to this department Byron D. Halsted, of the Bussey Institute, whose exhibits have been very interesting and instructive. They commenced on the 9th of June, with twelve species of Fungi, growing upon wild plants, the plants and the fungi growing upon them being all carefully named. At the Rose Show Mr. Halsted presented twenty-five genera of Lichens in fifty species; and at the Strawberry Show, twenty genera of Grasses in thirty-two species; two genera in four species of *Juncaceæ;* eighteen Sedges, including seventeen species of *Carex*, and *Eleocharis obtusa;* also twenty-three genera of Fungi in forty species.

On the 11th of August, Mr. Halsted presented sixty-five species of "Wild Plants in Fruit," ranging from trees like the oak and hickory down to grasses, and herbs of even smaller growth. It will be seen that the term *fruit* is here used in its broad botanical sense, including all ripened pistils and their contents, whatever their form or texture, and not, as the word is popularly employed, to designate only those that are edible.

Of the Fleshy fruits, the Berry was represented by *Solanum Dulcamara* (Bittersweet), three species of *Vaccinium* (Blueberries and Cranberry), *Actæa alba* (Baneberry), *Cornus Canadensis*, etc. The Drupe or Stone fruit by *Prunus Virginiana* and *P. Pennsylvanica* (Choke and Wild Red Cherries), *Rhamnus catharticus* (Buckthorn), *Ilex verticillata* (Black Alder), and some *Viburnums*, in-

cluding the showy red fruit of *V. lantanoides*. The Drupelets had a representative in the fruit of the *Rubus villosus* (Blackberry). The Dry fruits had the Akene represented by several members of the orders *Ranunculaceæ* and *Rosaceæ*. The Nut by the Oak, Hazel, Hickory, and Butternut. The Key fruit by the Maple and Birch. The Pod fruits included the *Asclepias Cornuti* (Milk-weed), and several specimens from the Mustard and Pulse families. Some Dehiscent fruits, or those which split open and drop their seeds, were shown in two species of *Lilium*, *Hypericum perforatum* (St. Johnswort), Mullein, etc. Last of all a number of cones of *Pinus* and *Abies* represented the Scaly, Multiple fruits.

Mr. Halsted also exhibited at the same time fifty species of wild flowers.

J. H. Sears exhibited *Draba verna*, and Mary T. Saunders *Draba Caroliniana*.

On the 8th of September, Miss Maria E. Carter exhibited a very interesting collection of *Compositæ*, consisting of seventy-five species. It being the largest number of that order shown at any one time we append a list of the species:

Vernonia Noveboracensis.
Liatris scariosa.
Eupatorium purpureum.
" *sessilifolium.*
" *perfoliatum.*
" *ageratoides.*
Mikania scandens.
Aster corymbosus.
" *macrophyllus.*
" *Radula.*
" *patens.*
" *lævis.*
" *lævis* var. *cyaneus.*
" *undulatus.*
" *cordifolius.*
" *multiflorus.*
" *dumosus.*
" *Tradescanti.*
" *miser.*
" *longifolius.*
" *puniceus.*
Aster Novæ-Angliæ.
" *linifolius.*
Erigeron Canadense.
" *strigosum.*
" *annuum.*
Diplopappus linariifolius.
" *umbellatus.*
" *cornifolius.*
Solidago squarrosa.
" *bicolor.*
" *latifolia.*
" *cæsia.*
" *puberula.*
" *sempervirens.*
" *neglecta.*
" *patula.*
" *arguta.*
Solidago altissima.
" *nemoralis.*
" *Canadensis.*
" *gigantea.*

Solidago lanceolata.
Inula Helenium.
Ambrosia artemisiæfolia.
Xanthium strumarium, var. *echinatum.*
Rudbeckia laciniata.
" *hirta.*
Helianthus divaricatus.
Coreopsis trichosperma.
Bidens frondosa.
" *chrysanthemoides.*
Maruta Cotula.
Achillea Millefolium.
Leucanthemum vulgare.
Tanacetum vulgare.
Artemisia vulgaris.
Gnaphalium polycephalum.
Gnaphalium uliginosum.
Antennaria margaritacea.
Erechthites hieracifolia.
Centaurea nigra.
Cirsium lanceolatum.
" *muticum.*
" *pumilum.*
" *arvense.*
Lappa major.
Cichorium Intybus.
Leontodon autumnale.
Hieracium Canadense.
" *scabrum.*
Nabalus albus.
Taraxacum Dens-leonis.
Lactuca elongata.
Sonchus oleraceus.

On the 2d of June, C. W. Jenks exhibited a very fine specimen of *Cypripedium acaule*, var. *alba*. From Mrs. J. W. Wolcott, on the 20th of June, we had very fine specimens of *Habenaria fimbriata*, var. *alba*. From Mrs. J. W. Wilmarth, on the 11th of August, *Sabbatia chloroides*—pink and white varieties; the flowers were very pretty. Other contributions to this department were made by James W. Clark, E. W. Mitchell, Master Hugh Tallant and H. A. Young.

Hollyhocks were exhibited by H. Grundel and A. McLaren. The spikes were the best of this popular flower that have been shown for several years, and the variety was excellent. John B. Moore also exhibited at several of the weekly exhibitions, very large fine spikes of flowers, and dishes of flowers.

Stocks.—The only collection on exhibition was from James Comley.

Late Phloxes.—Unusually good collections were shown by Francis Parkman and John B. Moore. On a visit to the grounds of Mr. Parkman, we saw some three thousand seedlings in bloom, which with their great variety of color presented a truly magnificent appearance, many of them surpassing the imported varieties growing in a bed near by. These seedlings were of fine form and substance, and quite distinct in color, giving every shade of pink, red, and rose, while quite a number had beautiful distinct eyes. Our

attention was also called to a bed of dwarf varieties not over fifteen inches high, which Mr. Parkman hopes by further experiments to reduce to even less height. We hope he may be successful, as there can be nothing finer than an edging of these beautiful flowers for a herbaceous border. Later in the season we visited the garden of John B. Moore, who has a superb collection of named varieties. No more satisfactory plants can be placed in our gardens; give them a rich, moist soil, and they will soon reward the efforts of the grower with large, handsome clumps of rich flowers.

PETUNIAS.—Several collections were placed upon exhibition, the best were those from Mrs. A. D. Wood and W. G. McTear, each collection containing fine flowers of self-colored and striped varieties.

GLADIOLI.—The principal exhibitors were J. S. Richards, George Craft, Herbert Gleason, A. McLaren, and J. B. Moore. Gladioli have been a very attractive feature of the exhibitions. In addition to the named varieties and the general displays which have been shown, various contributors have from time to time shown very good seedlings, but although many of them were very fine and worthy of cultivation, there were none which in the judgment of your Committee possessed qualifications so superior to the many well-known standard varieties as to warrant a special award. The number of varieties is simply legion, and they have been brought to such a high standard of perfection that it would be very difficult to improve on what we already have.

NATIVE FERNS.—On the 20th of June, George E. Davenport exhibited a collection of forty species and six varieties of hardy native ferns, grown outside, in his garden. Of this collection, *Adiantum Capillus-Veneris*, L., is deserving of special mention on account of its having survived a long winter so far north, with no other protection than a slight covering of brush and in a southern exposure. The collection included, also, *Asplenium Filix-fœmina*, var. *laciniata*, Moore (an English variety discovered in New Jersey in 1875), and *Woodsia glabella*, R. Br., from Vermont, of both which it is believed that cultivated specimens have never been exhibited before.

August 4th, E. H. Hitchings showed an interesting collection of thirty-four species and varieties of ferns, collected in the towns of Chelsea, Stoneham, Melrose, Malden, Hyde Park, Milton, Ded-

ham, and Canton. These were, with but two or three exceptions, whole plants, showing the manner of growth.

August 11th, being prize day, two good collections were shown by Mrs. C. N. S. Horner and F. W. Morandi. George E. Davenport also presented, for exhibition only, a large collection, of which the following had never before been exhibited: *Aspidium argutum*, Kaulf., from California; *Woodsia hyperborea*, R. Br., from Vermont, and *Botrychium simplex*, Hitch., from New York State.

On the 1st of September Mr. Hitchings exhibited a collection of nine different forms of *Botrychium ternatum*, and again on the 10th of November, a collection of eighteen plants, in various forms, which was the greatest variety of this species we have seen in the same number of plants.

Asters.—Excellent stands were shown by C. M. Atkinson, E. Shepherd, Parker Barnes, J. S. Richards, John Parker, Mrs. E. M. Gill, John B. Moore, and A. McLaren. Asters are among our most useful garden plants, and from the ease with which they are cultivated, have become great favorites.

Verbenas.—The show was excellent; there were several contributors, of whom the successful ones were J. B. Moore and A. McLaren. It is gratifying to see that this once most popular of all bedding plants is receiving so much attention, and is exhibited in such goodly varieties.

Double Zinnias.—There was more than usual competition for the prizes offered for this popular annual. Large and very handsome flowers were shown by J. B. Moore, George Craft, James Nugent, W. G. McTear, W. K. Wood, and Mrs. E. M. Gill.

Greenhouse Plants.—The best six in bloom exhibited in April, were by C. M. Atkinson and were fine healthy specimens of *Azaleas*, *Kennedyas*, etc.

At the Annual Exhibition the competitors for the best twelve Greenhouse and Stove Plants were H. H. Hunnewell, Hovey & Co., W. Gray, Jr., and W. C. Strong. The collection from Mr. Hunnewell was of unusual excellence, each plant being a superb specimen. The species were as follows:

Alocasia macrorhiza variegata.—One of the most striking and effective ornamental leaved plants ever introduced, and the very best specimen ever shown.

A. metallica.—Another highly ornamental plant.

Bromelia sceptrum.

Croton Johannis.

C. Youngii.—A robust growing plant of very beautiful form.

C. Weismanni.—One of the best and most ornamental of the genus.

Dieffenbachia Bausei.—One of the finest hybrids of this very ornamental genus.

Eurya latifolia var.

Ficus Parcelli.—A very pretty variegated leaved plant, of free growth.

Hydrangea speciosa.

Maranta Van-den-Heckei.—A very distinct and handsome growing species from Brazil.

Martenezia Lindeniana.—A very handsome plant of this exceedingly ornamental species of American Palms.

From Hovey & Co., the following species:

Alocasia macrorhiza var.

Aralia pulchra.

Camellia Sasanqua var.

Cyanophyllum magnificum.

Dion Edule.—A splendid plant well worthy a place in every collection of ornamental leaved plants.

Dasylirion glauca.

Latania rubra.—One of the finest species of the genus.

Pandanus elegantissimus.—An elegant plant well adapted for decorative purposes.

P. ornatus.—A noble growing species from the Philippines.

Phormium Veitchii.—A fine species of this ornamental genus of plants.

Seaforthia elegans.—A very useful plant, of the highest decorative character.

Thrinax parviflora.—The leaves of this plant are of great beauty, and it is well adapted for decorative purposes.

Although H. H. Hunnewell and Hovey & Co. were the successful competitors, Wm. Gray, Jr. and W. C. Strong exhibited good collections; in each were many rare and choice plants.

SPECIMEN PLANTS were exhibited by H. H. Hunnewell and Hovey & Co. From Mr. Hunnewell came a magnificent specimen plant of *Musa superba.* It is the first time it has been exhibited, and we append the following description taken from "Williams' Stove and Greenhouse Plants:" "A very distinct and handsome plant,

but requiring strong heat and a moist atmosphere to develop its beauties. In a young state it is not very different in appearance from *M. sapientum* and its varieties, but as its leaves increase in size, the stem becomes swollen towards the base, and the whole plant assumes more the appearance of a grand compact form of *M. ensete*, though from this plant it is abundantly distinct. *M. superba* is a somewhat rare and magnificent plant, but from its size only suitable for those possessing ample room and a large collection."

The specimen presented by Hovey & Co. was *Cycas revoluta*, an old plant, popularly, but, Mr. Williams says, erroneously, called the Sago Palm, since it has nothing to do with the Palms. Mr. W. further says, "as a window plant when young, and for the decoration of hall and corridors when large, it is surpassed by none and equalled by few. In Saxony its leaves are extensively used at funerals as emblems of immortality."

Specimen Flowering Plant.—The successful competitor was J. B. Moore, who brought a good plant of the beautiful *Lapageria alba*.

Variegated Leaved Plants.—For this prize, Hovey & Co., exhibited the following varieties: *Alocasia macrohiza var.*, *Ananassa sativa var.*, *Eurya latifolia var.*, *Agave medio-picta*, *Bambusa Fortunei var.*, and *Yucca aloifolia var.*

From W. C. Strong we had *Eulalia Japonica var.*, *Croton pictum*, *C. angustifolium*, *Pandanus Javanicus*, *Dracæna amabilis*, and *Agave medio-picta*. The plants in these collections were small but well grown.

For the prize for the best single specimen not offered in any collection, H. H. Hunnewell sent a splendid specimen of *Anthurium crystallinum*, and Hovey & Co. a good plant of *Phormium Colensoi var.*

Caladiums.—There were several competitors for this prize and all the collections were made up of good varieties; C. M. Atkinson and Hovey & Co. were the successful competitors. There were also some new ones from W. T. Andrews, but though they were all good, there did not appear to be distinction enough between them and the many well known varieties now in cultivation to require any special note.

Ferns.—Nine named varieties were shown by J. Warren Merrill, as follows:

Alsophila australis, a very beautiful species of rapid growth.

Cibotium Barometz.

C. princeps, a noble fern requiring plenty of room.

Dicksonia antarctica, a very beautiful species with a stout stem and large spreading fronds; well known as one of the most useful of its class.

Gleichenia circinata glauca.—From New Zealand, and worthy a place in every collection of ferns, being one of the most robust and beautiful of the group to which it belongs.

G. dicarpa.—One of the most elegant of the genus; it is said to be a good grower and one of the best of the section to which it belongs.

Oleandra nodosa.

Platycerium grande. One of the most singular of all ferns. It is an epiphytal evergreen stove species; a native of New Holland and the Malayan Islands.

Polypodium musæfolium.

Hovey & Co. exhibited the following species:

Adiantum cuneatum, an old fern but indispensable in every collection, and will do well in a moderate temperature; splendid for bouquets.

A. macrophyllum.

Alsophila Van Gheerti.

Asplenium Fabianum.

Davallia Mooreana. This is one of the most beautiful of ferns, the fronds are extremely handsome and gracefully arched.

D. Tyermanni.

Gymnogramme Tartarea, an ornamental, evergreen, stove species.

Leucostegia immersa.

Six new varieties were shown by J. Warren Merrill, as follows: *Davallia Boryana*, *Lomaria fluviatilis*, *Lygodium Fosteri*, *Aglamorpha Meyeniana*, *Adiantum cristatum*, *Asplenium longissimum.*

Adiantums.—J. Warren Merrill and Hovey & Co., were the exhibitors. From Mr. Merrill came the following varieties:

Adiantum Farleyense.—Very properly called the grandest of the *Adiantums*. It derives its name from the place of its origin, Farley Hill, Barbadoes, West Indies.

A. gracillimum (Mist Adiantum).—The most graceful and elegant mist-like form yet introduced. As the plant becomes stronger it is very elegant.

A. Hendersoni.—A distinct plant of robust habit, which when well grown presents a very graceful appearance.

A. princeps.—A free growing plant, with very gracefully arched fronds, and of great value for exhibition or decorative purposes.

A. prionophyllum.

A. rubellum.—A very pretty fern, which should be in every collection, and if grouped with other delicate ferns will be a pleasing addition.

Hovey & Co.'s collection comprised

A. amabile.—This is one of the most lovely of the Maiden-hairs, and cannot fail to become a favorite in all choice collections.

A. concinnum.—A very graceful, pendulous, evergreen, stove species, from the West Indies.

A. concinnum latum.—A new variety of *A. concinnum*, but of stronger growth, making a fine plant for decorative purposes.

A. decorum.—A lovely fern; said to be of very easy growth.

A. excisum multifidum.

A. Farleyense.

Tree Ferns.—Two very fine plants of *Alsophila australis* were shown by W. C. Strong. It is one of the noblest of the tree ferns.

Single Specimens Tree Ferns were shown by J. Warren Merrill and W. C. Strong. Mr. Merrill brought a fine plant of *Cibotium Schiedei*, a very elegant species, with large, spreading, pale green fronds, which, if placed in a prominent position, presents a very imposing appearance. It may be grown in a cool house. Mr. Strong brought a good plant of *Balantium antarcticum* (*Dicksonia antarctica*).

Mr. Merrill also exhibited at the Annual Show, a great variety of ferns cultivated by him, a list of which he has furnished the Committee, as follows:

Exotic Ferns.

Cionidium Moorei (new).
Leucostegia immersa (new).
Davallia elata (new).
" *clavata.*
" *aculeata.*
Adiantum tetraphyllum.
Cheilanthes elegans.
" *lendigera* (new).
Woodwardia radicans cristata (new).
Sadleria squarrosa (new).
Diplazium plantagineum (new).
" *Zeylanicum.*
Pleopeltis stigmatica (new).
Gymnogramme Peruviana.
" *Wettenhalliana.*
" *chrysophylla*, var. *Parsonsii* (new).
Dictyogramme Japonica.
" " *variegata.*

Native Ferns.

Acrostichum aureum (rare).
Polypodium Plumula, H. B. K.
" *intermedium.*
" *incanum* (rare).
" *Scouleri* (rare).
" *Californicum.*
" *Phyllitidis.*
" *aureum.*
" *alpestris* (new and very rare).
Gymnogramme triangularis.
Notholæna ferruginea (new and very rare).
Notholæna dealbata (new and very rare).
Notholæna Newberryi.
Cheilanthes Californica.
" *Alabamensis.*
" *microphylla.*
" *Fendleri.*
" *vestita.*
" *gracillima* (new and very rare).
" *Eatoni.*
" *languginosa.*
" *myriophyllum.*
" *viscosa.*
Pellæa Bridgesii.
" *atropurpurea.*
" *ornithopus.*
" *flexuosa.*
" *densa.*
Pteris longifolia.
" *Cretica.*
" *aquilina*, var. *caudata.*
Adiantum Capillus-Veneris.
Vittaria lineata.
Blechnum serrulatum.
" *Spicant.*
Woodwardia radicans.
" *Virginica.*
" *areolata.*
Scolopendrium vulgare.
Camptosorus rhizophyllus.
Asplenium pinnatifidum (rare).
" *ebenoides.*
" *Trichomanes.*
" *ebeneum.*
" " var. *parvulum*, Mart et Gal.
" *viride.*
" *dentatum* (rare).
" *septentrionale* (new and rare).
" *myriophyllum.*
" *marinum.*
Aspidium Lonchitis.
" *munitum.*
" *Californicum.*
" *aculeatum.*
" " var. *Braunii.*
" *patens.*
" *fragrans.*
" *cristatum*, var. *Floridanum.*
" *argutum.*
" *unitum.*
Nephrolepis exaltata.
Trichomanes Petersii.
" *radicans.*
Aneimia adiantifolia.
Lygodium palmatum.

In addition to the collection just named, Mr. Merrill has shown at the weekly exhibitions, good plants of the following:

Davallia (*Microlepia?*) *anthriscifolia.*
Lindsaya cultrata.
Cheilanthes viscosa.
Pellæa ternifolia.
Pteris serrulata, var. *Leyi.*
Doodia lunulata.
" *caudata.*
Asplenium attenuatum.
" *monanthemum.*
" *Filix-fœmina*, var. *Victoria.*
Polystichium lepidocaulon (new and rare).
Lastrea sanctum.
Nephrolepis pectinata.
Fadyenia prolifera.
Polypodium Phegopteris.
" *Dryopteris.*
" *calcareum.*
Phegopteris hexagonoptera.
" *polypodioides.*
Niphobolus pertusus.
Goniopteris gracilis.
Gymnogramme triangularis.
Hemionitis palmata.
Acrostichum quercifolium (*Gymnopteris Neitneri*).

Lycopods.—The only collection was from W. C. Strong, who exhibited *Lycopodium delicatissimum*, *L. denticulatum aureum*, *L. involvens*, *L. circinale*, *L. stoloniferum*, and *L. Japonicum paradoxum.*

Dracænas.—Six finer plants have seldom, if ever, been seen on exhibition than those from H. H. Hunnewell. The varieties were

Dracœna amabilis.—A very handsome variety, and perhaps the finest of the light variegated kinds.

D. Chelsoni.—A fine growing species; the leaves are very large and the colors rich, producing a splendid effect.

D. imperialis.—Also a fine growing variety, and well adapted for general decorative purposes.

D. Mooreana, a noble plant of graceful habit; the base of the leaf-stalk and midrib are of a bright reddish color, which in the leaf changes to a glossy bronze.

D. Shepherdii.—A large and splendid growing plant, which well deserves a place in every collection.

D. Youngii.—This superb variety is well adapted for conservatory decoration or exhibition purposes; it is a noble plant, with very bright colors, and becomes more beautiful with age.

The plants from Hovey & Co. were much smaller, but the selection of varieties was very good. They were *D. amabilis*, *D. imperialis*, and *D. Shepherdi*, which have already been described, and the three following:

D. Guilfoylei.—This variety is quite distinct from any other

species. It is a splendid plant for both ornamental and decorative purposes.

D. Hendersoni.—Of graceful and elegant habit; color of the leaves bright green, beautifully marbled, with pink and white stripes.

D. stricta.—This has the habit, general character, and color of *D. ferrea*, but the leaves are beautifully feathered and flaked with brilliant rosy crimson and carmine.

Seedling Dracænas, have been exhibited by F. L. Harris and Edward Butler. Mr. Harris presented one of dwarf habit; leaves very wide in proportion to their length (six inches wide and thirteen inches long), waved and much arched, giving the plant a distinct and unique appearance; margin of leaf and petiole of a rich magenta, inclining to purple, and in the young leaves of an extremely delicate hue; the edging of color of variable and irregular width, but never extending into the body of the leaf. The seed was sown in 1876 and was the result of a cross between *Reginæ* and *Mooreana*. It is a very valuable addition to this highly useful and ornamental genus of plants.

From Edward Butler, gardener to Wellesley College, came six seedling *Dracænas*, as follows:

Wellesleyana (No. 1).—Of vigorous growth and ample foliage, the leaves being full sixteen inches in length, exclusive of the petioles, and six inches wide, oval, pointed, the extremities turned downwards. The color is dark bronzy green, margined more or less widely with deep magenta rose, inclining to crimson, and frequently broadening out irregularly and covering nearly the whole leaf; a narrow margin of color extends down the edge of the petiole to the very base. The under side of the leaf, and especially the petiole, have a glaucous hue. The midrib on the under side is deeply colored throughout. The young leaves are variegated with white, which soon changes to pink, and with maturity becomes of a still deeper color. The plant is about two years old, and five feet high; a cross between *stricta* and *Reginæ*, of excellent habit, holding its lower leaves, and forming a very handsome plant. It is undoubtedly the best of the six seedlings shown by Mr. Butler.

No. 2. In general habit similar to *Wellesleyana*, but a little more compact, the color more striped and blended with the green, and the young leaves of a lighter green.

No. 3 and *No.* 5, are of taller and slenderer growth, and have

lanceolate foliage; the young leaves of the former are striped with white, while those of the latter are variegated with purplish crimson, even in their youngest stages.

No. 4. The most vigorous of all; leaves seven inches in width, with a very narrow edge of purplish magenta; the midrib and small veins of the same color, and the petiole of a deeper shade; of the type of *Braziliensis*.

No. 6. Of comparatively dwarf habit; lanceolate leaves; edges of leaves and petioles magenta scarlet, often extending irregularly into the body of the leaf.

The last five are the result of the same cross as produced *Wellesleyana*, viz., between *stricta* and *Reginæ*, and while in general appearance and habit they are somewhat like the parent plants, they are more vigorous in growth and a great improvement over them, being fully equal to any of the high priced imported varieties.

It is very gratifying to know that the attention of our practical gardeners has been called to the improvement by cross-fertilization of this highly ornamental and useful genus of plants, and we are glad to know that the labors of Mr. Harris and Mr. Butler have been rewarded by the production of these beautiful hybrids. Other seedlings, which are very fine, will be exhibited from time to time as they are more fully developed.

Palms.—William Gray, Jr., exhibited *Areca lutescens*, a fine palm for table decoration, being small and dwarf; with graceful fronds of pale green color. It is worthy a place in every collection; Mr. Gray also presented *Livistonia rotundifolia*.

From Hovey & Co., came *Pritchardia Pacifica variegata* and *Phœnix reclinata*, the latter a very fine greenhouse palm; a native of South Africa.

Pitcher Plants.—The only collection exhibited was from William Gray, Jr., who showed the well known *Sarracenia purpurea; S. psittacina*, a native of Florida; and *Darlingtonia Californica*, a singular and very interesting plant.

Agaves.—John C. Hovey and Hovey & Co., were the exhibitors, with two good collections. Of late years, Agaves have become very popular for ornamental purposes, and should any of the readers of this report wish for further information in regard to culture and varieties they are referred to an excellent article with descriptions of a large number of varieties, in Williams' "Choice Stove and Greenhouse Plants," second edition, Vol. II., page 71.

The varieties shown by J. C. Hovey were *Agave Americana longifolia variegata*, *A. medio-picta*, *A. applanata*, *A. filifera*, *A. Schidigera*, *A. Verschaffeltii*.

From Hovey & Co. came *Agave Americana medio-picta*, *A. applanata*, *A. Besseriana amœna*, *A. dealbata*, *A. heteracantha cœrulea*, *A. hystrix*.

Cacti.—Two excellent collections were shown by J. C. Hovey, the best containing fifteen new and rare species and varieties not exhibited in 1876, viz: —

Cereus Peruvianus,
Echinocactus cylindricus,
" *gibbosus ferox*,
" *Pfersdorffii*,
Echinocereus cinerascens,
Echinopsis Huotti,
" *Schelhasii*,
Mammillaria gracilis,
Mammillaria Hopferiana,
" *impoxicoma*,
" *nivea cristata*,
Opuntia crassa gigantea,
" *integrifolia*,
" *megacantha*,
" *Rafinesquiana*.

Succulents (other than Agaves and Cacti).—The only exhibitor was John C. Hovey; we note the following new and rare species not exhibited in 1876:

Aloe colubrina,
" *serra*,
Echeveria Scaphylla,
Euphorbia mammillaris,
Gasteria acinacifolia,
" *elongata*,
" *lœtepunctata*,
" *subnigricans*,
Gasteria obtusifolia,
Pachyphytum linguæfolia,
Haworthia expansa,
" *margaritifera*,
" *Reinwarti*,
Rochea perfoliata,
Stapelia erucoides.

Mr. Hovey also exhibited twelve new and rare Agaves, and seventy-seven other succulent plants. A very interesting feature of his exhibits was that they were very neatly and plainly labelled, a duty too often neglected by exhibitors.

New Pot Plant.—H. H. Hunnewell exhibited a magnificent specimen of *Phyllotœnium Lindeni*, of which Mr. Williams in his work on "Stove and Greenhouse Plants," second edition, Vol. II., p. 88, says, "It is a magnificent, and at the same time, the only species at present known. The leaves are large, measuring from nine inches in length, and six inches in breadth; they are broadly

sagittate, with large lobes or ears; the ground color is a light, shining green, the midrib is silvery white, as also are the branching midribs of the lobes, the secondary veins are also striped with the same metallic lustre. The petioles are round, curiously striped with black, and usually from one to two feet in height. It is equally effective as an ornament to the stove or the exhibition table, and should find a place in every collection where ornamental-leaved plants are grown. Native of the forests of New Grenada."

CELOSIA PYRAMIDALIS.—Specimens were shown by C. M. Atkinson and J. S. Richards, which were quite attractive; the flowers are very ornamental, and are produced in great profusion, in spikes of the most beautiful feathery character.

DAHLIAS have been shown by Macey Randall, S. G. Stone, Hovey & Co., James Nugent, and J. B. Moore. The different collections have been very good; particularly noticeable were those of Macey Randall and S. G. Stone.

BOUQUETS.—The contributors to this department were James Nugent, Hovey & Co., Mrs. E. M. Gill, Mrs. S. Joyce, James O'Brien, James Comley, and W. G. McTear. While there have been some good bouquets shown, as a whole they have not been up to the highest standard.

BASKETS OF FLOWERS have been shown by Mrs. A. D. Wood, Mrs. S. Joyce, Mrs. E. M. Gill, and Hovey & Co. These names are a sufficient guarantee of the character of the productions, which are always among the principal attractions of the exhibitions.

TABLE DESIGNS have been shown by Mrs. Wood, Mrs. Joyce, Mrs. Gill, and Hovey & Co., have been arranged in good taste, with choice flowers, and have added much to the attractions of the tables. The effort made last year to create a more spirited competition in table designs, by modifying the General Rules so that persons competing in this class could use flowers not raised by themselves, has proved a complete failure, not one person other than the regular contributors having presented a single design.

CUT FLOWERS were shown at the Annual Exhibition by J. B. Moore, W. K. Wood, Mrs. Gill, J. O'Brien, W. C. Strong, Hovey & Co., James Nugent, S. G. Stone, W. G. McTear, and John Parker. Several of the stands were very handsomely filled, and were kept through the exhibition; others were not properly attended to each day, which detracted very much from the general effect. We trust that no person will in future engage a stand for cut flowers at

the annual exhibition, unless he intends to keep it in good order by renewal each day. At the weekly exhibitions W. K. Wood, J. B. Moore, Mrs. Gill, and Hovey & Co. have been the principal exhibitors. The stands have been finely arranged with choice flowers, and have added greatly to the appearance of the hall; at no time have the displays at the weekly exhibitions been so well kept up.

Fifty named varieties of Annuals and Perennials.—Hovey & Co., J. B. Moore and C. M. Atkinson have been the contributors, each having shown good collections of named varieties, which have been an instructive feature of the exhibition; but your Committee again repeat, as in the two preceding years, that the competition has not met their expectations.

Rustic Stands.—Two excellent stands, arranged in good taste, with choice plants, were shown by Hovey & Co. and W. J. Vass.

Evergreen Trees and Shrubs.—W. C. Strong exhibited thirty-six varieties of hardy evergreeens, comprising ten varieties of Retinisporas, twelve of Spruces, and eight of Arbor Vitæs, with Junipers, Pines, etc., forming an interesting collection.

Chrysanthemums.—This exhibition occurred on the 10th of November, and was a great success—the best show of this flower ever held by the Society. The value of the Chrysanthemum for fall and winter decoration can hardly be over-estimated; the splendid plants exhibited by H. L. Higginson and C. M. Atkinson, bear ample proof of this. The plants from Mr. Higginson, both bush and standards, were superb specimens, and gave good evidence of the ability of his excellent gardener, Joseph Clark; we have no fear of contradiction when we say that these plants were perfect. Mr. Atkinson is sufficiently well known as a good plantsman to need no further commendation on our part. John B. Moore and James Comley also exhibited plants in pots, and E. Sheppard, B. G. Smith, and James Nugent cut flowers.

New and Rare, or Fine Specimen Plants.—C. M. Atkinson exhibited

Begonia glaucophylla scandens, a very fine, graceful growing variety, with beautiful orange flowers. It is a splendid basket plant.

Imatophyllum miniatum.—A fine specimen plant with seven spikes of flowers.

Rhynchospermum jasminioides.—A very handsomely trained specimen plant, filled with its beautiful white flowers.

Anthurium variegatum.—Very pretty.

Gloxinia Mrs. J. L. Gardner.

Spiræa ariæfolia.

Hydrangea hortensis.—Two very handsomely trained specimen plants; the largest and best exhibited.

Thibaudia pulchra.—A very elegant plant; the flowers are very pretty, and will pay well for good care.

From E. S. Rand, Jr., came a good plant of *Anthurium Scherzerianum*, in fine bloom; also *Hexacentris Mysorensis*, a splendid climbing plant for the stove; if desired for exhibition purposes it may be trained to a trellis in such a manner that its long, pendulous branches will show to the best advantage; for decorative purposes it will be found highly useful. Also, *Thunbergia laurifolia*, another stove climbing plant of great beauty; the flowers are very large, and of a pale blue color, with a yellow throat.

From J. Warren Merrill, *Aphelexis splendens* (See TRANSACTIONS for 1877, Part I., p. 108).

From J. B. Moore, very fine sprays of flowers of *Lapageria rosea.*

From Jackson Dawson, *Salvia carduacea* (new).

From Mrs. E. M. Gill, *Browallia Roezli*, new, and a great acquisition to this useful class of plants; also, Hydrangea Thomas Hogg.

From F. L. Ames, *Croton Disraeli* (Veitch), a distinct and effective plant, furnished with broad, three lobed or halberd shaped leaves of a glossy green, and spotted with golden yellow—one of the most interesting and remarkable of all *Crotons* in cultivation. Also, *Aralia elegantissima.*

From Benj. Grey, *Torenia Fournieri*, new and very pretty.

From Miss S. W. Story, *Eulalia Japonica.*

W. C. Strong presented at the Rose Exhibition a very good collection of plants, among them some very fine specimens of

Aloe nobilis,	*Eucalyptus globulus*,
Alsophila australis,	*Hechtea Ghiesbreghtii*,
Cyathea medullaris,	*Maranta zebrina*,
Dyckia regalis,	*Musa ensete.*

From J. C. Hovey, a good collection of *Iris Kœmpferi.*

From Daniel Duffley, a very fine specimen of *Amaryllis Belladonna*, with twenty-eight spikes of its lovely flowers.

From W. T. Andrews, a fine collection of Begonias, consisting of varieties Rei Fernando Major, Madlle. Henrietta Graux (new, 1877), Berenice (new, 1877), Argentea hirsuta, and Michael

Angelo. These were shown in August, and in September another collection of six varieties was presented. All were nice specimen plants, and the varieties were distinct and good.

From C. W. W. Wellington, very fine specimens of *Liatris pycnostachya.*

From Hovey & Co., came the following:

Allamanda Wardleiana, a very fine acquisition. The lobes of the corolla are broader and rounder and of greater substance than in any other species; the throat is also darker in color, and the outside of the flower is of a reddish shade; it blooms nearly all the year round.

Statice Holfordi.—One of the most beautiful greenhouse plants, producing a succession of large racemes of bright blue and white flowers, which remain in perfection for two or three months.

Imatophyllum miniatum and *I. nobilis*, of easy culture, and when in bloom very effective and beautiful plants.

From John Parker, Pelargonium Peter Grieve; this plant was grown in a window, and showed that it had received good care; it was one of the best window plants we have seen.

From L. H. Foster, a fine specimen plant of *Erica densa.*

From W. J. Vass, *Poinsettia pulcherrima, fl. pl.* (cut specimens).

From J. W. Blanchard, a good specimen plant of *Rhynchospermum jasminioides.*

From M. H. Merriam, a very fine plant of *Bougainvillea glabra;* without doubt one of the most showy of the genus; every collection will be enriched by a plant of this variety. It is said to be the best for pot culture.

In conclusion particular attention is again called to the Schedule of Prizes for 1878. Although the premiums in some cases have been reduced, they have been kept up as liberally as the appropriation will allow, and it is earnestly hoped that the small reduction made will not be deemed by cultivators a sufficient reason for a decrease of interest in the exhibitions.

As Chairman I wish to tender to the Committee my sincere thanks for their prompt and efficient support for the past season, and for the perfect harmony attending our deliberations.

This report was adopted by the Committee at a meeting held December 1, 1877.

JOHN G. BARKER, CHAIRMAN.

PRIZES AND GRATUITIES AWARDED FOR PLANTS AND FLOWERS.

JANUARY 6.

Gratuity:—

To James Comley, for *Azalea Indica*, ... $2 00

JANUARY 21.

Gratuities:—

To James Comley, for choice Roses, ... 1 00
M. H. Merriam, for Specimen Hybrid Perpetual Rose, 3 00
W. J. Vass, for Cut Flowers, ... 1 00

JANUARY 27.

Gratuities:—

To John B. Moore, for Cut Flowers, ... 1 00
Mrs. E. M. Gill, " " " 1 00
Mrs. S. Joyce, " " " 1 00
Mrs. A. D. Wood, " " " 1 00
James Comley, " " " 1 00
W. J. Vass, " " " 1 00

FEBRUARY 3.

CYCLAMENS.—For the best six in pots, to C. B. Gardiner, 6 00
For the second best, to James O'Brien, . . . 5 00
TABLE DESIGN.—For the best other than a Basket of Flowers, to Mrs. E. M. Gill, ... 5 00
For the second best, to Mrs. S. Joyce, . . . 4 00

Gratuities:—

To C. M. Atkinson, for *Phaius grandifolius* and *Begonia glaucophylla scandens*, ... 6 00
Mrs. C. N. S. Horner, for Fernery of Native Plants, . 5 00
John B. Moore, " Specimen Azalea, . . 3 00

To C. B. Gardiner, for Cyclamen,		$3 00
E. A. Hall,	" "	2 00
L. H. Foster,	" Rose Buds,	1 00
James Comley,	" Cut Flowers,	2 00
John B. Moore,	" " "	2 00
W. K. Wood,	" " "	2 00
Miss S. W. Story,	" " "	2 00
W. J. Vass,	" " "	1 00
B. G. Smith,	" " "	1 00

FEBRUARY 10.

Gratuities:—

To Mrs. A. D. Wood, for Cut Flowers,	2 00
Mrs. E. M. Gill, for Amaryllis,	1 00
Marshall P. Wilder, for Azaleas,	3 00

FEBRUARY 17.

Gratuities:—

To J. Warren Merrill, for Cinerarias,	6 00
J. B. Moore, for Specimen Azaleas,	4 00
" " " choice Cut Roses,	2 00
C. M. Atkinson, choice Lilacs,	3 00
A. McLaren, for Seedling Amaryllis,	1 00

FEBRUARY 24.

Gratuities:—

To Marshall P. Wilder, for Azaleas,	4 00
C. M. Atkinson, for a fine specimen of *Imatophyllum miniatum*,	3 00
L. H. Foster, for *Erica densa*,	2 00
J. B. Moore, for Azaleas,	4 00
" " " fine blooms of Hybrid Perpetual Roses,	2 00

MARCH 3.

CAMELLIAS.—For the best display of named varieties, cut flowers, not less than twenty blooms, to Hovey & Co.,	6 00
ORCHIDS, WINTER BLOOMING.—For the best three varieties, to E. S. Rand, Jr.,	10 00

PARLOR BOUQUETS.—For the best pair, to Hovey & Co., $5 00
HYBRID PERPETUAL ROSES.—For the best six plants in pots, of distinct varieties, to J. B. Moore, . . 12 00
For the second best, to J. B. Moore, . . . 10 00
For the best twelve blooms, not less than six distinct varieties, to J. B. Moore, ... 5 00
For the second best, to J. B. Moore, . . . 4 00
For the third best, to J. B. Moore, ... 3 00
SPRING FLOWERING BULBS.—For the best collection in pots, the second prize to Hovey & Co., . . 8 00
HYACINTHS.—For the best nine in pots, to C. M. Atkinson, 6 00
For the best six in pots, to C. M. Atkinson, . . 4 00
For the second best, " " " . . 3 00
For the best three in pots, " " " . . 3 00
For the second best, to Hovey & Co., . . 2 00
For the best two, in pots, to C. M. Atkinson, . . 2 00
For the best single specimen, to C. M. Atkinson, . 1 00
NARCISSUS.—For six pots, three bulbs in a pot, the second prize to Hovey & Co., ... 4 00
For three pots, the second prize to Hovey & Co., . 3 00

Gratuities:—

To Marshall P. Wilder, for Azaleas, ... 3 00
Francis Parkman, for Rose Celine Forestier, . . 3 00
C. B. Gardiner, for Cyclamens, ... 10 00
Hovey & Co., for Basket of Camellias, . . . 3 00
E. S. Rand, Jr., for specimen *Anthurium Scherzerianum*, ... 3 00
John Parker, for Pelargonium Peter Grieve, . . 2 00
J. B. Moore, for Collection of Hyacinths, . . . 3 00
Mrs. N. P. Russell, for Hyacinths, ... 2 00
Henry W. Goodwin, " " 2 00
C. M. Atkinson, for Violets in pots, ... 3 00
Mrs. L. P. Weston, for *Tropæolum tricolorum*, . . 2 00
J. B. Moore, for Tea Roses, ... 2 00
" " " Amaryllis, ... 3 00
Mrs. E. M. Gill, for Cut Flowers, ... 1 00
Benj. G. Smith, " " " 1 00
W. J. Vass, " " " 1 00
Mrs. S. Joyce, " " " 1 00
Mrs. A. D. Wood, " " " 3 00

MARCH 10.

Gratuities:—

To E. S. Rand, Jr., for *Hexacentris Mysorensis*,	$1 00
W. J. Vass, for choice Cut Flowers,	2 00
J. B. Moore, for fine plants of Hybrid Perpetual Roses,	8 00
" " " " Cut Roses,	2 00
" " " " Azaleas,	3 00

MARCH 24.

Gratuities:—

To J. Warren Merrill, for *Aphelexis splendens*,	1 00
W. J. Vass, for Cut Flowers and Azaleas,	3 00
Marshall P. Wilder, for Azaleas,	5 00
James Comley, for Roses and Cut Flowers,	2 00

MARCH 30.

Gratuities:—

To James Comley, for choice Tea Roses,	2 00
C. M. Atkinson, for Roses in Pots,	4 00
J. W. Blanchard, for *Rhynchospermum jasminioides*,	2 00
J. B. Moore, for Azaleas,	6 00
Mrs. E. M. Gill, for *Richardia maculata*,	1 00

AZALEA EXHIBITION.

APRIL 7.

INDIAN AZALEAS.—For the best six named varieties, in pots, to Hovey & Co.,	$25 00
For six named varieties in eight-inch pots, the second prize to Hovey & Co.,	10 00
For the best single specimen, to C. M. Atkinson,	10 00
GREENHOUSE PLANTS.—For the best six, in bloom, to C. M. Atkinson,	20 00
POLYANTHUS.—For the best six, in pots, to C. M. Atkinson,	5 00
BASKET OF FLOWERS.—For the best arranged, to Mrs. A. D. Wood,	4 00
For the second best, to Hovey & Co.,	3 00

Gratuities: —

To Marshall P. Wilder, for Azaleas,		$8 00
Hovey & Co.,	" "	8 00
M. H. Merriam, for a fine specimen plant of *Bougainvillea glabra*,		5 00
C. M. Atkinson, for Hybrid Perpetual Roses, in pots,		4 00
" " " Basket of Roses,		2 00
W. J. Vass,	" Pot Plants,	2 00
B. G. Smith,	" Pansies,	1 00
George E. Davenport, for *Trillium nivale*,		1 00
Miss S. W. Story,	" Floral Design,	2 00
Mrs. E. M. Gill,	" Basket of Flowers,	1 00
James Comley,	" choice Cut Flowers,	3 00
W. J. Vass,	" Cut Flowers	2 00
J. B. Moore,	" " "	2 00

APRIL 14.

Gratuities: —

To J. Warren Merrill, for Calceolarias,		8 00
James Comley, for Cut Flowers,		1 00

APRIL 21.

Gratuities: —

To Hugh Tallant, for Native Flowers,		1 00
George E. Davenport, for Native Flowers,		1 00

APRIL 28.

Gratuities: —

To John B. Moore, for *Lapageria rosea*,		1 00
James Comley, for choice Roses,		2 00

PELARGONIUM EXHIBITION.

MAY 5.

PELARGONIUMS.—For the best six named Zonale varieties, to William Gray, 3d,	15 00
For six named bronze varieties, the second prize to Hovey & Co.,	10 00
CALCEOLARIAS.—For six varieties, in pots, the second prize to C. M. Atkinson,	8 00

TABLE DESIGN.—For the best, other than a Basket of Flowers, to Hovey & Co., ... $4 00
For the second best, to Mrs. A. D. Wood, . . 3 00
TULIPS.—For the best twenty-five named flowers, to C. M. Atkinson, ... 5 00

Special Prize, offered by Peter Smith.

For the best Specimen Variegated Zonale Pelargonium, to William Gray, 3d, ... 6 00

Gratuities:—

To J. Warren Merrill, for choice Ferns, . . . 3 00
Hovey & Co., for Variegated Zonale Pelargoniums, . 5 00
" " " Azaleas, ... 3 00
Miss Fanny Brewer, for *Saxifraga Virginiensis*, . 1 00
W. J. Vass, " *Anthurium Scherzerianum*, . 1 00
Jackson Dawson, " *Salvia carduacea*, . . 1 00
George E. Davenport, for Native Plants, . . . 1 00
Miss A. C. Wheeler, " Dish of Flowers, . . 1 00
Mrs. E. M. Gill, " Basket of Flowers, . . 1 00

MAY 12.

Gratuity:—

To George E. Davenport, for choice Native Flowers, . 1 00

MAY 19.

Gratuities:—

To J. B. Moore, for Seedling Gloxinias, . . . 2 00
Mrs. E. M. Gill, for Cut Flowers, ... 1 00
W. J. Vass, " " " 1 00
Mrs. A. D. Wood, " " " 1 00
Francis Parkman, " collection of Dwarf Iris, . . 2 00
William Gray, Jr., " *Cypripediums*, ... 2 00
C. W. Jenks, " *Cypripedium pubescens*, . . 1 00
E. S. Rand, Jr., " Native Plants, ... 1 00

JUNE 2.

CUT FLOWERS.—For the best display, filling 150 bottles, to W. K. Wood, ... 6 00
For the second best, to Mrs. E. M. Gill, . . 5 00
For the third best to J. B. Moore, . . . 4 00

TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce, ... $5 00
For the second best, to Mrs. A. D. Wood, . . 4 00
BOUQUETS.—For the best pair of Parlor Bouquets, to James Comley, ... 4 00
For Hand Bouquets, the second prize, to Mrs. E. M. Gill, ... 2 00
HARDY SHRUBS.—For the best display, to Hovey & Co., 5 00
For the second best, to Miss S. W. Story, . . 4 00
For the third best to Miss A. C. Kenrick, . . 3 00
NATIVE PLANTS.—For the best display of named species and varieties, to Mrs. C. N. S. Horner, . . 5 00
RHODODENDRONS.—For the best twelve named varieties, one truss of each, to H. H. Hunnewell, . . 10 00

Hunnewell Premiums.

HARDY RHODODENDRONS.—For the best display of named varieties, to C. M. Atkinson, ... 35 00
HARDY AZALEAS.—For the best display of named varieties, to Hovey & Co., ... 20 00
For the second best, to E. Sheppard, . . . 10 00
For the third best to B. G. Smith, . . . 5 00

Gratuities:—

To H. H. Hunnewell, for Rhododendrons and Azaleas, 5 00
E. Sheppard, " Rhododendrons, . . . 1 00
Marshall P. Wilder, " collection of Pæonies, . . 5 00
J. B. Moore, " Gloxinias, ... 2 00
C. W. Jenks, " *Cypripedium acaule*, var. *alba*, 1 00
Mrs. L. P. Weston, " Pansies, ... 1 00
Geo. E. Davenport, " Native Plants, . . . 1 00
E. W. Mitchell, " " " . . . 1 00
Miss A. C. Wheeler, " Dish of Flowers, . . . 1 00
Mrs. S. Joyce, " Cut Flowers, . . . 2 00

JUNE 9.

Gratuities:—

To H. H. Hunnewell, for Rhododendrons and Azaleas, 5 00
" " " new and rare Rhododendrons, 10 00
Francis B. Hayes, " Rhododendrons, . . . 1 00
Mrs. Needham, " *Acanthus latifolius*, . . 1 00

To John B. Moore,	for *Cerastium alpinum*, . .	$1 00
James Cartwright,	" *Cattleya crispa*, . . .	1 00
Miss S. A. Bradbury,	" Air Plants, ...	1 00
Byron D. Halsted,	" Fungi, ...	2 00
Mrs. S. Joyce,	" Cut Flowers, . . .	1 00
Mrs. E. M. Gill,	" " " . . .	1 00

JUNE 16.

Gratuities: —

To William Gray, Jr., for a fine stand of Hybrid Perpetual Roses, ...	5 00
W. J. Vass, for Plants, ...	1 00
J. B. Moore, for choice Cut Flowers, . . .	2 00
Mrs. E. M. Gill, for " " . . .	1 00
Mrs. S. Joyce, " " " . . .	1 00

ROSE EXHIBITION.

JUNE 20.

HARDY PERPETUAL ROSES.—For the best six new varieties sent out since 1873, to William Gray, Jr., . .	$25 00
For the best twelve distinct named varieties, to C. M. Atkinson, ...	10 00
For the second best, to Francis Parkman, . .	8 00
For the third best, to C. M. Atkinson, . . .	6 00
For the best six distinct named varieties, to William Gray, Jr., ...	6 00
For the second best, to Francis Parkman, . .	5 00
For the third best, to John B. Moore, . . .	4 00
For the best three named varieties, to William Gray, Jr.,	4 00
For the third best, to John B. Moore, . . .	2 00
MOSS ROSES.—For the best twelve named varieties, to W. H. Spooner, ...	10 00
TENDER ROSES.—For the best twelve named varieties, to James Comley, ...	10 00
For the best twelve Marechal Niel, to M. D. Spalding,	5 00
For the best twelve of any other variety of Tea Rose, to James Comley for Souvenir de Malmaison, .	5 00
GENERAL DISPLAY.—For the best, to J. S. Richards, .	15 00
For the second best, to E. W. Wood, . . .	10 00

Special Prizes for Hybrid Perpetual Roses.

For the best twelve of any one variety, to J. B. Moore,	$25 00
For the best six of any one variety, to J. S. Richards,	15 00
For the best twelve named varieties, to Francis Parkman,	25 00
For the best six named varieties, to J. C. Chaffin,	15 00
SPECIMEN PLANT.—For the best specimen plant of a kind for which no special prize is offered, to A. B. Gilbert,	10 00
NATIVE PLANTS.—For the best display of named species and varieties, to Mrs. C. N. S. Horner,	5 00
WARDIAN CASE.—For the best, to D. R. Beckford, Jr.,	10 00
For the second best, to Hovey & Co.,	8 00
HERBACEOUS PÆONIES.—For ten named varieties, the second prize to A. McLaren,	4 00
SWEET WILLIAMS.—For the best thirty trusses, not less than ten distinct varieties, to James Nugent,	5 00
For the second best, to Harry L. Rand,	4 00
CUT FLOWERS.—For the best display to W. K. Wood,	5 00
For the second best, to Hovey & Co.,	4 00
For the third best, to J. O'Brien,	3 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce,	4 00
For the second best, to Mrs. E. M. Gill,	3 00
For the third best, to Mrs. A. D. Wood,	2 00
BOUQUETS.—For the best pair of Parlor Bouquets, to Hovey & Co.,	4 00
For the second best, to James Comley,	3 00
For the best pair of Hand Bouquets to James O'Brien,	4 00
For the second best, to James Nugent,	3 00

Gratuities:—

To William Gray, Jr., for a magnificent stand of Baronne de Rothschild Rose,	15 00
W. H. Spooner, for Roses,	5 00
M. D. Spalding, for Collection of Roses,	3 00
A. McLaren, for Roses,	1 00
Hovey & Co., for Moss Roses,	1 00
W. C. Strong, for Collection of Plants,	20 00
Hovey & Co., " " "	10 00

To F. L. Ames, for choice Plants,	$8 00
C. M. Atkinson, for *Rhynchospermum jasminioides*,	5 00
D. R. Beckford, Jr., for *Broughtonia sanguinea*,	1 00
Miss A. C. Kenrick, for *Magnolia macrophylla*,	1 00
Mrs. J. W. Wolcott, for *Habenaria fimbriata*,	2 00
E. H. Hitchings, for *Hottonia inflata*,	1 00
Hovey & Co., for Richardson's Seedling Pæonies,	2 00
Mrs. S. Joyce, for Gloxinias,	2 00
Miss S. W. Story, for Dianthus,	1 00
James Comley, for Cut Flowers,	4 00
C. M. Atkinson, " " "	2 00
Mrs. E. M. Gill, " " "	3 00
Miss A. C. Kenrick, " " "	1 00
Miss S. W. Story, for Basket of Flowers,	2 00
J. Warren Merrill, for Ferns,	3 00

STRAWBERRY SHOW.

JUNE 27.

CUT FLOWERS.—For the best display, to W. K. Wood,	$5 00
For the second best, to Hovey & Co.,	4 00
For the third best, to James Nugent,	3 00
BASKET OF FLOWERS.—For the best arranged, to Mrs. S. Joyce,	3 00
PARLOR BOUQUETS.—For the best pair, to James O'Brien,	3 00
For the second best, to James Nugent,	2 00

Gratuities:—

To J. S. Richards, for Roses,	5 00
William Gray, 3d, for Hybrid Perpetual Roses,	3 00
Miss S. W. Story, for Table Design,	3 00
Mrs. E. M. Gill, for *Bilbergia*,	1 00
D. R. Beckford, Jr., for *Oncidium*,	1 00
M. W. Clark, for *Myosotis*,	1 00
Miss S. W. Story, for *Dianthus*,	1 00
Harry L. Rand, for Sweet Williams,	2 00
Miss A. C. Wheeler, for Cut Flowers,	1 00
Miss A. C. Kenrick, " " "	1 00
Mrs. L. P. Weston, for Bouquet and Pansies,	2 00
Byron D. Halsted, for *Drosera* and *Utricularia*,	2 00

To Byron D. Halsted, for Collection of named Fungi, .	$5 00
" " " " " " Grasses,	5 00
Mrs. C. N. S. Horner, for Native Flowers, . .	3 00
E. H. Hitchings, " " " . . .	1 00

JULY 7.

CUT FLOWERS.—For the best display, to W. K. Wood, .	5 00
For the second best, to Hovey & Co., . . .	4 00
For the third best, to James Nugent, . . .	3 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce, ...	3 00
For the second best, to James O'Brien, . . .	2 00
Gratuities:—	
To C. M. Atkinson, for Plants, ...	3 00
Mrs. S. A. F. Mead, for *Hoya carnosa*, . . .	2 00
W. G. McTear, for *Eucomis regia*, ...	1 00
Mrs. A. D. Wood, for Balsams, ...	1 00
Harry L. Rand, for Tropæolums, ...	1 00
Francis Putnam, for Seedling Amaryllis, . . .	1 00
C. M. Atkinson, for Carnations and Picotees, . .	1 00
Mrs. E. M. Gill, for Basket of Flowers, . .	2 00
Miss S. W. Story, " " " " . .	2 00
Mrs. A. D. Wood, " " " " . .	2 00
Miss A. C. Wheeler, " " " " . .	1 00
Hovey & Co., for Cut Flowers, ...	2 00
J. B. Moore, " " "	1 00
J. S. Richards, for *Lilium Canadense*, . . .	2 00
James Comley, " " *Philadelphicum*, . .	2 00
E. H. Hitchings, for Native Flowers, . . .	2 00
Mrs. C. N. S. Horner, for Native Plants, . .	2 00
George E. Davenport, " " " . . .	1 00
J. W. Merrill, for Ferns, ...	2 00

JULY 14.

CUT FLOWERS.—For the best display, to W. K. Wood, .	5 00
For the second best, to Mrs. E. M. Gill, . .	4 00
For the third best, to Hovey & Co., . . .	3 00
HAND BOUQUETS.—For the best pair, to W. G. McTear,	3 00
For the second best, to J. O'Brien, . . .	2 00

TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce,	$3 00
For the second best, to J. O'Brien,	2 00
NATIVE PLANTS.—For the best display of named species and varieties, to Mrs. C. N. S. Horner,	5 00
Gratuities:—	
To W. J. Vass, for Plants,	1 00
E. A. Story, for *Justicia carnea*,	1 00
" " " Double Lobelia	1 00
James Nugent, for Bouquets of Sweet Peas,	1 00
Stiles Frost, " " " "	1 00
Harry L. Rand, for Lilies,	1 00
Francis Putnam, for Amaryllis,	1 00
C. M. Atkinson, " Hollyhocks and Carnations,	3 00
" " " Seedling Carnations and Picotees,	2 00
Macey Randall, for Dahlias,	1 00
John B. Moore, " Cut Flowers,	2 00
J. S. Richards, " " "	1 00
James Nugent, " " "	2 00
W. J. Vass, " " "	2 00
James Comley, " " "	1 00
Miss A. C. Wheeler, for Dish of Flowers,	1 00
Mrs. A. D. Wood, for Table Design,	2 00
George E. Davenport, for Native Flowers,	1 00
E. H. Mitchell, " " "	1 00
James Comley, " *Lilium Canadense*,	1 00

JULY 21.

HOLLYHOCKS.—For the best twelve spikes, of twelve distinct colors, to Herman Grundel,	10 00
For the second best, to A. McLaren,	8 00
ORCHIDS.—For three varieties in bloom, the second prize to James Cartwright,	8 00
CUT FLOWERS.—For the best display, to Hovey & Co.,	5 00
For the second best, to W. K. Wood,	4 00
For the third best, to Mrs. E. M. Gill,	3 00
BASKET OF FLOWERS.—For the best arranged, to Mrs. S. Joyce,	3 00

PARLOR BOUQUETS.—For the best pair, the second prize to James Comley,		$2 00

Gratuities:—

To J. Warren Merrill,	for Ferns,	3 00
C. M. Atkinson,	" *Oncidium Wentworthianum*,	2 00
Francis Putnam,	" Seedling Amaryllis,	1 00
J. O'Brien,	" new Dwarf Candytuft,	1 00
J. B. Moore,	" fine Hollyhocks,	3 00
James Nugent,	" "	2 00
C. M. Atkinson,	" "	1 00
E. Sheppard,	" "	1 00
D. R. Beckford, Jr.,	" Native Flowers,	1 00
E. H. Hitchings,	" " "	1 00
Mrs. C. N. S. Horner,	" " "	3 00
Miss A. C. Wheeler,	" Dish of Flowers,	1 00
J. O'Brien,	" Cut Flowers,	2 00
Mrs. L. P. Weston,	" " "	1 00
George Craft,	" " "	1 00
James Nugent,	" " "	1 00
Mrs. A. D. Wood,	" " "	1 00
W. J. Vass,	" " "	1 00

JULY 28.

CUT FLOWERS.—For the best display, to W. K. Wood,	5 00
For the second best, to Mrs. E. M. Gill,	4 00
For the third best, to Hovey & Co.,	3 00
For the best collection of fifty named varieties of Greenhouse Flowers, to Hovey & Co.,	6 00
BASKET OF FLOWERS.—For the best arranged, to Hovey & Co.,	3 00
For the second best, to Mrs. S. Joyce,	2 00
FUNGI.—For the best collection of named varieties, to Byron D. Halsted,	4 00

Gratuities:—

To A. McLaren, for Hollyhocks,	1 00
" " " Amaryllis,	2 00
E. A. Story, " Lilies,	1 00

To Mrs. C. N. S. Horner,	for Native Plants,	$3 00
George E. Davenport,	" " "	2 00
Miss M. E. Carter,	" " "	2 00
E. H. Hitchings,	" " "	1 00
Byron D. Halsted,	" Weeds and Wild Plants,	2 00
Miss A. C. Wheeler,	" Dish of Flowers,	1 00
J. B. Moore,	" Cut Flowers,	2 00
George Craft,	" " "	2 00
Samuel Hartwell,	" " "	2 00
James Nugent,	" " "	1 00
James Comley,	" " "	1 00
Mrs. L. P. Weston,	" " "	1 00

AUGUST 4.

STOCKS.—For six varieties, one plant of each, the second prize, to James Comley,	3 00
HAND BOUQUETS.—For the best pair, to James Nugent,	3 00
For the second best, to James O'Brien,	2 00
CUT FLOWERS.—For the best display, to J. B. Moore,	5 00
For the second best, to Hovey & Co.,	4 00
For the third best, to W. K. Wood,	3 00
For the best collection of fifty named varieties of Annuals and Perennials, to Hovey & Co.,	6 00
For the second best, to J. B. Moore,	4 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce,	5 00
For the second best, to Hovey & Co.,	4 00
NATIVE FLOWERS.—For the best display of named species and varieties, to George E. Davenport,	5 00
For the second best, to Mrs. C. N. S. Horner,	4 00

Gratuities:—

To James Nugent,	for *Stanhopea tigrina*,	1 00
E. A. Story,	" *Lilium auratum*,	1 00
E. Sheppard	" " "	1 00
J. S. Richards,	" Gladioli,	5 00
Francis Parkman,	" Seedling Phlox,	3 00
A. McLaren,	" Hollyhocks,	2 00
Macey Randall,	" Dahlias,	2 00

To James Comley,	for collection of Roses,	$1 00
George Craft,	" Cut Flowers,	3 00
W. J. Vass,	" " "	2 00
James Comley,	" " "	1 00
Mrs. C. B. Chase,	" " "	1 00
James Nugent,	" " "	1 00
Mrs. L. P. Weston,	for Cut Flowers,	1 00
E. Sheppard,	" " "	1 00
Miss A. C. Wheeler,	" Dish of Flowers,	1 00
Byron D. Halsted,	" New England Algæ,	8 00
" "	" Native Ferns and Flowers,	3 00
E. H. Hitchings,	" collection of Native Ferns,	8 00
" "	" Native Flowers,	1 00
Eddie W. Mitchell,	" " "	2 00

AUGUST 11.

LATE PHLOXES.—For the best ten distinct named varieties, to Francis Parkman,	4 00
For the second best, to J. B. Moore,	3 00
PETUNIAS.—For the best collection of double and single varieties, to Mrs. A. D. Wood,	4 00
For the second best, to W. G. McTear,	3 00
CUT FLOWERS.—For the best display, to J. B. Moore,	5 00
For the second best, to Mrs. E. M. Gill,	4 00
For the third best, to Hovey & Co.,	3 00
BASKET OF FLOWERS.—For the best arranged, to Hovey & Co.,	3 00
For the second best, to Mrs. S. Joyce,	2 00
NATIVE FERNS.—For the best display of named species, not cultivated, to Mrs. C. N. S. Horner,	5 00
For the second best, to F. W. Morandi,	4 00

Gratuities:—

To C. M. Atkinson,	for Specimen Hydrangeas,	10 00
J. S. Richards,	" Gladioli,	8 00
Francis Parkman,	" Seedling Phlox,	3 00
W. T. Andrews,	" Begonias,	3 00
Macey Randall,	" Dahlias,	2 00
E. A. Story,	" Lilies,	1 00
A. McLaren,	" Hollyhocks,	1 00

To James Comley,	for	Roses,	$1 00
Mrs. S. Joyce,	"	Pomegranate Flowers,	1 00
C. M. Atkinson,	"	*Lilium lancifolium*,	4 00
Daniel Duffley,	"	*Amaryllis Belladonna*,	3 00
C. W. W. Wellington,	for	*Liatris pycnostachya*,	2 00
Hovey & Co.,	"	*Peristeria elata*,	1 00
M. H. Merriam,	"	Cut Flowers,	2 00
George Craft,	"	" "	2 00
James Nugent,	"	" "	1 00
Mrs. A. D. Wood,	"	Basket of Flowers,	2 00
Mrs. C. B. Chase,	"	" "	1 00
Miss A. C. Wheeler,	"	Dish of "	1 00
Byron D. Halsted,	"	Native "	3 00
" "	"	" Plants in Fruit,	2 00
George E. Davenport,	"	" Flowers,	3 00
" "	"	" Ferns,	3 00
E. H. Hitchings,	"	" Flowers,	2 00
Mrs. H. D. Wilmarth,	"	" "	2 00

AUGUST 18.

GLADIOLI.—For the best twenty named varieties, in spikes, to J. S. Richards,	10 00
For the second best, to George Craft,	8 00
For the best ten named varieties, to J. S. Richards,	6 00
For the second best, to George Craft,	5 00
For the best display of named or unnamed varieties, to J. S. Richards,	10 00
For the second best, to George Craft,	8 00
For the third best, to Herbert Gleason,	6 00
PARLOR BOUQUETS.—For the best pair, the second prize to James Comley,	2 00
HAND BOUQUETS.—For the best pair, to J. O'Brien,	3 00
For the second best, to Mrs. E. M. Gill,	2 00
CUT FLOWERS.—For the best display, to J. B. Moore,	5 00
For the second best, to Mrs. E. M. Gill,	4 00
For the third best, to W. K. Wood,	3 00
For the best collection of fifty named varieties of Annuals and Perennials, to Hovey & Co.,	6 00
For the second best, to C. M. Atkinson,	4 00

TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce, ... $3 00
For the second best, to Hovey & Co., . . . 2 00

Gratuities:—

To E. A. Story, for Lilies and Gladioli, . . . 2 00
M. H. Merriam, for Gladioli, ... 1 00
A. McLaren, " " 1 00
" " " Hollyhocks, ... 2 00
F. Webster, for Petunias, ... 2 00
Macey Randall, for Dahlias, ... 3 00
E. Sheppard, for Lilies, ... 1 00
Hovey & Co., " *Rhexia Virginica*, . . . 1 00
" " " *Bignonia grandiflora*, . . 1 00
C. M. Atkinson, for *Thibaudia pulchra*, . . . 2 00
" " " *Lilium auratum*, . . . 1 00
J. Warren Merrill, for choice Ferns, . . . 3 00
James Nugent, for Cut Flowers, ... 1 00
D. R. Beckford, Jr., for Dish of Flowers, . . . 2 00
Mrs. C. B. Chase, " " " . . . 2 00
Miss A. C. Wheeler, for Basket of Flowers, . . 1 00
George E. Davenport, for Native Plants, . . . 2 00
Byron D. Halsted, for Native Plants, . . . 2 00
E. H. Hitchings, " " Ferns, . . . 1 00

AUGUST 25.

ASTERS.—For the best thirty flowers, not less than ten varieties, to C. M. Atkinson, ... 5 00
For the second best, to E. Sheppard, . . . 4 00
For the third best, to Parker Barnes, . . . 3 00
For the best fifteen flowers, not less than six varieties, to J. S. Richards, ... 3 00
For the second best, to John Parker, . . . 2 00
For the third best, to Mrs. E. M. Gill, . . . 1 00
POMPONS.—For the best sixty blooms, not less than six varieties to Parker Barnes, ... 4 00
For the second best, to J. B. Moore, . . . 3 00
For the third best, to A. McLaren, ... 2 00
CUT FLOWERS.—For the best display, to E. W. Wood, . 5 00
For the second best, to Mrs. E. M. Gill, . . 4 00
For the third best, to Hovey & Co., . . . 3 00

Basket of Flowers.—For the best arranged, to Mrs. S. Joyce,	$3 00
For the second best, to Hovey & Co.,	2 00
Gratuities:—	
To George Craft, for Gladioli,	8 00
J. S. Richards, " "	6 00
M. H. Merriam, " "	2 00
A. McLaren, for Hollyhocks and Gladioli,	2 00
Macey Randall, for Dahlias,	3 00
Hovey & Co., " "	1 00
E. Sheppard, " " and Asters,	1 00
Harry L. Rand, for Tropæoleums,	1 00
E. Sheppard, for *Lilium auratum*,	1 00
C. W. W. Wellington, for *Liatris sphæroidea*,	1 00
James Comley, for Plants and Flowers,	1 00
E. A. Story, for Cut Flowers,	2 00
W. J. Vass, " " "	2 00
J. B. Moore, " " "	3 00
F. B. Hayes, " " "	1 00
James Nugent, " " "	1 00
D. R. Beckford, Jr., for Dish of Flowers,	1 00
Miss A. C. Wheeler, " " " "	1 00
George E. Davenport, for Native Plants,	2 00
H. A. Young, " " "	2 00
Mrs. C. N. S. Horner, " " Flowers,	2 00
" " " " " " Ferns,	1 00

September 1.

Verbenas.—For the best collection, to J. B. Moore,	4 00
For the second best, to A. McLaren,	3 00
Cut Flowers.—For the best display, to J. B. Moore,	5 00
For the second best, to W. K. Wood,	4 00
For the third best, to Mrs. E. M. Gill,	3 00
For the best collection of fifty named varieties of Annuals and Perennials, to C. M. Atkinson,	6 00
For the second best, to Hovey & Co.,	4 00
Basket of Flowers.—For the best arranged, to Mrs. A. D. Wood,	3 00
For the second best, to Hovey & Co.,	4 00

NATIVE PLANTS.—For the best display of named species and varieties, to Mrs. C. N. S. Horner, . . $5 00
For the second best, to Byron D. Halsted, . . 4 00

Gratuities:—

To W. T. Andrews, for Begonias, ... 5 00
George Craft, for Gladioli, ... 5 00
Macey Randall, for Dahlias, ... 4 00
Hovey & Co., " " 1 00
S. G. Stone, " " 1 00
A. McLaren, for Hollyhocks, ... 1 00
Hovey & Co., " Pot Plants, ... 2 00
" " " *Vallota purpurea*, ... 2 00
Daniel Duffley, for *Nerine coruscans*, . . . 2 00
James Nugent, for Cut Flowers, ... 1 00
S. G. Stone, " " " 1 00
Miss A. C. Wheeler, for Dish of Flowers, . . 1 00
D. R. Beckford, " " " " . . . 1 00
Mrs. C. B. Chase, " " " " . . . 1 00
E. H. Hitchings, for *Botrychiums*, ... 3 00
George E. Davenport, for Native Plants, . . . 2 00
Eddie W. Mitchell, for Native Flowers, . . . 1 00

SEPTEMBER 8.

DOUBLE ZINNIAS.—For the best twenty flowers, six varieties, to J. B. Moore, ... 4 00
For the second best, to W. G. McTear, . . . 3 00
For the third best, to George Craft, . . . 2 00
For the best ten flowers, four varieties, to James Nugent, 3 00
For the second best, to George Craft, . . . 2 00
For the third best, to Mrs. W. Latham, . . . 1 00
CUT FLOWERS.—For the best display, to W. K. Wood, . 5 00
For the second best, to J. B. Moore, . . . 4 00
For the third best, to Mrs. E. M. Gill, . . . 3 00
BASKET OF FLOWERS.—For the best arranged, to Mrs. A. D. Wood, ... 3 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Hovey & Co., ... 5 00
For the second best, to Mrs. E. M. Gill, . . 4 00

Gratuities:—

To J. S. Richards, for Gladioli,	$6 00
George Craft, " "	5 00
W. T. Andrews, " Begonias,	5 00
Hovey & Co., " Dahlias,	2 00
James Comley, " *Echinocactus cylindricus*,	2 00
J. Warren Merrill, for Ferns,	2 00
Miss A. C. Wheeler, for a Dish of Flowers,	1 00
Miss S. W. Story, " " " "	1 00
Hovey & Co., " " " "	1 00
James Nugent, for Cut Flowers,	1 00
Miss M. E. Carter, for Native Plants,	5 00
Mrs. C. N. S. Horner, " " "	2 00
Byron D. Halsted, for Grasses and Sedges,	5 00
" " " Native Flowers,	2 00

ANNUAL EXHIBITION.

SEPTEMBER 18, 19, 20, AND 21.

GREENHOUSE PLANTS.—For the best twelve greenhouse and stove plants, of different varieties, to H. H. Hunnewell,	$35 00
For the second best, to Hovey & Co.,	30 00
SPECIMEN PLANT.—For the best, not variegated, of a kind for which no special prize is offered, to H. H. Hunnewell,	10 00
For the second best, to Hovey & Co.,	6 00
SPECIMEN FLOWERING PLANT.—For the best, to J. B. Moore,	10 00
VARIEGATED LEAVED PLANTS.—For the best six varieties not offered in the collection of greenhouse plants, to Hovey & Co.,	15 00
For the second best, to W. C. Strong,	10 00
For the best single specimen, not offered in any collection, to H. H. Hunnewell,	5 00
For the second best, to Hovey & Co.,	4 00
CALADIUMS.—For the best six varieties, to C. M. Atkinson,	6 00
For the second best, to Hovey & Co.,	5 00

FERNS.—For the best nine named varieties, to J. Warren Merrill,	$15 00
For the second best, to Hovey & Co.,	10 00
For the best six new varieties, to J. Warren Merrill,	10 00
ADIANTUMS.—For the best six varieties, to J. Warren Merrill,	10 00
For the second best, to Hovey & Co.,	8 00
TREE FERNS.—For the best two, to W. C. Strong,	15 00
For the best single specimen, to J. Warren Merrill,	6 00
For the second best, to W. C. Strong,	5 00
LYCOPODS.—For the best six named varieties, to W. C. Strong,	5 00
DRACÆNAS.—For the best six named varieties, to H. H. Hunnewell,	10 00
For the second best, to Hovey & Co.,	6 00
PALMS.—For the best pair, to William Gray, Jr.,	10 00
For the second best, to Hovey & Co.,	6 00
PITCHER PLANTS.—For the best three, to William Gray, Jr.,	8 00
AGAVES.—For the best six distinct varieties, to J. C. Hovey,	15 00
For the second best, to Hovey & Co.,	10 00
CACTI.—For the best twenty-five species and varieties, to J. C. Hovey,	10 00
For the second best, to J. C. Hovey,	8 00
SUCCULENTS.—For the best collection (other than Agaves and Cacti), of twenty-five species and varieties, to J. C. Hovey,	15 00
For the second best, to Hovey & Co.,	10 00
BEST NEW POT PLANT.—It having never before been shown at any exhibition of the Society, to H. H. Hunnewell, the Society's Silver Medal.	
CELOSIA PYRAMIDALIS.—For the best four, to C. M. Atkinson,	5 00
For the best three, to J. S. Richards,	4 00
GLADIOLI.—For the best display and best kept during the exhibition, of named or unnamed varieties, filling two hundred bottles, to J. S. Richards,	10 00
For the second best, to George Craft,	8 00
For the third best, to H. Gleason,	6 00

DAHLIAS.—For the best twelve named varieties, to S. G. Stone,	$6 00
For the second best, to Macey Randall,	5 00
For the third best, to Hovey & Co.,	4 00
For the best six named varieties, to James Nugent,	4 00
For the second best, to Hovey & Co.,	3 00
For the best single flower, to S. G. Stone,	2 00
For the best general display, filling 100 bottles, to Macey Randall,	8 00
For the second best, to S. G. Stone,	6 00
For the third best, to Hovey & Co.,	4 00
LILIPUTIAN DAHLIAS.—For the best general display, filling 50 bottles, to Macey Randall,	4 00
For the second best, to S. G. Stone,	3 00
PARLOR BOUQUETS.—For the best pair exhibited on Wednesday, to James Nugent,	6 00
For the second best, to Hovey & Co.,	4 00
For the best pair on Thursday, to James Nugent,	6 00
For the second best, to Hovey & Co.,	4 00
HAND BOUQUETS.—For the best pair exhibited on Wednesday, to Mrs. E. M. Gill,	6 00
For second best, to Mrs. S. Joyce,	4 00
For the best pair on Thursday to Mrs. S. Joyce,	6 00
For the second best, to James Nugent,	4 00
CUT FLOWERS.—For the best display and best kept during the exhibition, filling 100 bottles, to J. B. Moore,	18 00
For the second best, to W. K. Wood,	16 00
For the third best, to Mrs. E. M. Gill,	14 00
For the fourth best, to James O'Brien,	12 00
For the fifth best, to W. C. Strong,	10 00
For the sixth best, to Hovey & Co.,	8 00
For the seventh best, to James Nugent,	6 00
BASKET OF FLOWERS.—For the best arranged and best kept through the exhibition, to Hovey & Co.,	6 00
For the second best, to Mrs. S. Joyce,	5 00
RUSTIC STAND.—For the best specimen, not less than three feet in height, to be planted with choice plants, to Hovey & Co.,	10 00
For the second best, to W. J. Vass,	8 00

TABLE DESIGN.—For the best, and best kept during the exhibition, to be arranged without fruit, and not to exceed four feet in height, to Mrs. E. M. Gill . $10 00
For the second best, to Mrs. A. D. Wood, . . 8 00

Hunnewell Premiums.

EVERGREEN TREES AND SHRUBS.—For the best display, in pots, to W. C. Strong, ... 8 00

Gratuities:—

To C. M. Atkinson, for *Eurya latifolia variegata*, . . 5 00
J. B. Moore, " *Maranta Makoyana*, . . 2 00
Wm. Gray, 3d, " *Caladium argyrites*, . . . 2 00
Hovey & Co., " *Hymenodium crinitum*, . . 2 00
" " " *Roezlia glauca*, . . . 5 00
" " " *Bonapartea juncea*, . . . 2 00
" " " *Phœnix reclinata*, . . . 3 00
James Comley, " *Amaryllis Josephine*, . . 2 00
D. R. Beckford, Jr., for *Ionopsis paniculata*, . . 1 00
James Comley, " *Nymphœa Devoniensis*, . 3 00
G. F. Fessenden, " *Abutilon* sp., . . . 1 00
W. J. Vass, " collection of Plants, . . 10 00
Hovey & Co., " " Ivies, . . 10 00
" " " " Coleus, . . 4 00
Byron D. Halsted, " Insectivorous Plants, . . 3 00
James Comley, " Plants, ... 2 00
J. C. Hovey, " new and rare Succulents, . 10 00
" " " new Agaves, . . . 5 00
F. W. Andrews, " Caladiums, . . . 5 00
W. C. Strong, " Begonias, ... 4 00
J. B. Moore, " Zinnias, ... 2 00
E. Sheppard, " Gladioli, ... 2 00
J. Warren Merrill, " rare Exotic Ferns, . . 8 00
" " " choice Native Ferns, . . 10 00
B. D. Halsted, " Fungi, ... 5 00
Mrs. C. N. S. Horner, " Native Plants, . . . 2 00
James Comley, " Basket of Roses, . . 2 00
Mrs. S. Joyce, " Old Style Basket, . . 1 00
Carl Deeterich, " Wardian Case, . . 3 00
W. H. Halliday, " Fern " . . 3 00
" " " Hanging Fern Case, . . 2 00

SEPTEMBER 29.

Gratuity:—

To S. G. Stone, for Dahlias, ... $5 00

OCTOBER 6.

TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce, ... 3 00
For the second best, to Mrs. E. M. Gill, . . 2 00
PARLOR BOUQUETS.—For the best pair, to James O'Brien, 4 00
For the second best, to James Nugent, . . . 3 00
HAND BOUQUETS.—For the best pair, to James Nugent, 3 00
For the second best, to James O'Brien, . . . 2 00

Gratuities:—

To Macey Randall for Dahlias, ... 3 00
S. G. Stone, " " 3 00
Hovey & Co., " " 1 00
J. C. Park, " Cockscombs, ... 3 00
B. G. Smith, " Dahlias and Cockscombs, . . 2 00
James Cartwright, for *Odontoglossum grande*, . 2 00
D. R. Beckford, Jr., " *Allamandas*, . . . 1 00
James Comley, " Pot Plants, . . . 1 00
" " " Bouquet of Roses, . . 1 00
J. B. Moore, " Cut Flowers, . . . 2 00
Mrs. A. D. Wood, " Basket of Flowers, . . 2 00
Mrs. C. N. S. Horner, " Native Plants, . . . 2 00
" " " " Fernery, ... 1 00

OCTOBER 27.

Gratuities:—

To S. G. Stone, for Dahlias, ... 2 00
James Comley, " Cut Flowers, ... 1 00
W. J. Vass, " " " 1 00

NOVEMBER 3.

To Hovey & Co., for Plants, ... 3 00
W. J. Vass, for Cut Flowers, ... 1 00
Mrs. E. M. Gill, for Basket of Flowers, . . . 1 00
Mrs. C. N. S. Horner, Native " . . . 3 00

CHRYSANTHEMUM SHOW.

NOVEMBER 10.

CHRYSANTHEMUMS.—For the best six distinct named Large Flowered varieties, to C. M. Atkinson,	$10 00
For the second best, to H. L. Higginson,	6 00
For the best six distinct named Pompons, to H. L. Higginson,	10 00
For the second best, to C. M. Atkinson,	6 00
For the best four named Liliputians, to H. L. Higginson,	4 00
For the best specimen plant, to H. L. Higginson,	5 00
For the second best, to C. M. Atkinson,	3 00
For the best twelve named Large Flowered varieties, cut specimens, to H. L. Higginson,	3 00
For the second best, to C. M. Atkinson,	2 00
For the best twelve named Pompon varieties, cut specimens, to H. L. Higginson,	3 00
For the second best, to C. M. Atkinson,	2 00
For the best general display of named or unnamed varieties, cut specimens, to E. Sheppard,	5 00
For the second best, to B. G. Smith,	4 00
For the third best to H. L. Higginson,	3 00
BASKET OF FLOWERS.—For the best arranged, to Mrs. A. D. Wood,	3 00
For the second best, to Mrs. S. Joyce,	2 00
HAND BOUQUETS.—For the best pair, to James Nugent,	3 00
For the second best, to James O'Brien,	2 00

Gratuities:—

To H. L. Higginson, for Chrysanthemums,	8 00
J. B. Moore, " "	5 00
James Comley, " "	4 00
C. M. Atkinson, " "	2 00
James Nugent, " "	1 00
Edward Butler, " *Calanthes*,	5 00
J. B. Moore, " *Cypripedium insigne*,	2 00

To Miss S. W. Story, for *Eulalia Japonica*,	. .	$1 00
M. H. Merriam, " Roses,	. . . .	1 00
W. J. Vass, " Plants and Flowers,	. .	2 00
Hovey & Co., " Plants,	. . . .	3 00
J. B. Moore, " Table Design,	. . .	3 00
James Comley, " Cut Flowers,	. . .	2 00
Mrs. E. M. Gill, " " "	. . .	1 00
E. H. Hitchings, " *Botrychium ternatum*,	. .	2 00

DECEMBER 1.

Gratuities: —

To W. J. Vass, for *Gesnera splendidissima* and *G. zebrina*,	2 00
James Cartwright, for *Cattleya Loddigesii*, . .	1 00
Mrs. A. D. Wood, for Dish of Flowers, . . .	1 00

DECEMBER 29.

Gratuities: —

To James Cartwright, for *Cypripedium insigne*, . .	1 00
H. H. Hunnewell, for *Euphorbia plenissima fl. pl.*, .	1 00

The following Medals and Certificates of Merit have been awarded: —

February 24. To Marshall P. Wilder, for Seedling Azaleas, First Class Certificate of Merit.

April 7. To C. B. Gardiner, for fine Cyclamen, Silver Medal.

Rose Show, June 20. To Byron D. Halsted, for a collection of Lichens, Silver Medal.

To Edward Butler, for Seedling *Dracæna*, *Wellesleyana*, Silver Medal.

To J. Warren Merrill, for a new and rare Fern, *Polystichium lepidocaulon*, First Class Certificate of Merit.

To George E. Davenport, for a splendid collection of Hardy Native Ferns, Silver Medal.

Annual Exhibition. To H. H. Hunnewell, for the best new Pot Plant, *Phyllotænium Lindeni*, Silver Medal.

To Edward Butler, for Seedling *Dracæna*, No. 3, Silver Medal.

The amount awarded to each contributor is as follows: —

Ames, F. L.	$8 00	Hovey & Co.	$421 00
Andrews, F. W.	18 00	Hovey, J. C.	63 00
Atkinson, C. M.	240 00	Hunnewell, H. H.	91 00
Barnes, Parker	7 00	Jenks, C. W.	2 00
Beckford, D. R., Jr.	21 00	Joyce, Mrs. S.	64 00
Blanchard, J. W.	2 00	Kenrick, Miss A. C.	6 00
Bradbury, Miss S. A.	1 00	Latham, Mrs. W.	1 00
Brewer, Miss F.	1 00	McLaren, A.	23 00
Butler, Edward	20 00	McTear, W. G.	10 00
Carter, Miss M. E.	7 00	Mead, Mrs. A. S.	2 00
Cartwright, James	15 00	Merriam, M. H.	14 00
Chaffin, J. C.	15 00	Merrill, J. W.	90 00
Chase, Mrs. C. B.	5 00	Mitchell, E. W.	5 00
Clark, M. W.	1 00	Moore, J. B.	222 00
Comley, James	83 00	Morandi, F. W.	4 00
Craft, George	59 00	Needham, Mrs.	1 00
Davenport, George E.	23 00	Nugent, James	70 00
Dawson, Jackson	1 00	O'Brien, J.	44 00
Deeterich, Carl	3 00	Park, J. C.	3 00
Duffley, Daniel	5 00	Parker, John	4 00
Fessenden, B. F.	1 00	Parkman, Francis	53 00
Foster, L. H.	3 00	Putnam, Francis	3 00
Frost, Stiles	1 00	Rand, E. S., Jr.	13 00
Gardiner, C. B.	19 00	Rand, Harry L.	9 00
Gilbert, A. B.	10 00	Randall, Macey	35 00
Gill, Mrs. E. M.	104 00	Richards, J. S.	106 00
Gleason, Herbert	12 00	Russell, Mrs. N. P.	2 00
Goodwin, Henry W.	2 00	Sheppard, E.	27 00
Gray, William, Jr.	95 00	Smith, B. G.	14 00
Gray, William, 3d,	26 00	Spalding, M. D.	8 00
Grundel, H.	10 00	Spooner, W. H.	15 00
Hall, E. A.	2 00	Stone, S. G.	29 00
Halliday, W. H.	5 00	Story, E. A.	10 00
Halstead, B. D.	59 00	Story, Miss S. W.	18 00
Hartwell, Samuel	2 00	Strong, W. C.	77 00
Hayes, F. B.	2 00	Tallant, Hugh	1 00
Higginson, H. L.	42 00	Vass, W. J.	48 00
Hitchings, E. H.	23 00	Webster, F.	2 00
Horner, Mrs. C. N. S.	58 00	Wellington, C. W. W.	3 00

Weston, Mrs. L. P. .	$8 00	Wood, Mrs. A. D. .	$48 00
Wheeler, Miss A. C. .	13 00	Wood, E. W. . .	10 00
Wilder, Marshall P. .	28 00	Wood, W. K. . .	70 00
Wilmarth, Mrs. H. D.	2 00	Young, H. A. . .	2 00
Wolcott, Mrs. J. W. .	2 00		

Amount appropriated, . . .	$3,000 00
" awarded, . . .	2,673 00
Balance, . .	$327 00
Amount awarded for Special Prizes, .	$164 00

REPORT

OF THE

COMMITTEE ON FRUITS,

FOR THE YEAR 1877.

By HERVEY DAVIS, CHAIRMAN.

The season now drawing to a close, has been very favorable for nearly all kinds of Fruits, and the exhibitions will compare very satisfactorily with those of the past few years, in regard to all fruits, excepting apples and blackberries. The show of apples has been the most inferior for several years, which is much to be regretted, as this is the most valuable fruit of the New England States, and the small crop will be a serious and irreparable loss.

It gives us much pleasure to see the interest that many of our oldest contributors still continue to manifest in our exhibitions; most prominent among whom may be mentioned Hon. Marshall P. Wilder and the Messrs. Hovey, all of whom joined the Society soon after its formation, now nearly half a century ago, the last Annual Exhibition having been the Forty-ninth. And while we speak of those who are with us, it is sad to recall how many of our most constant exhibitors are gone. Among those most prominent and greatly missed, it may not be out of place to mention, as always present at our exhibitions, Josiah Stickney, Francis Dana, Frederick Clapp, Joseph H. Fenno, and B. B. Davis; all of them very active and constant contributors. But while we mourn the loss of those tried friends, we are glad to see coming forward to take their places so many young and enthusiastic persons, who, we doubt not, will make our exhibitions as good and interesting as those of past years. It is also very gratifying to see the general interest manifested at the present time, in originating new hybrid and other seedlings of different species of fruits, which must in the near future,

result in giving us some very desirable new kinds. When we look upon the valuable collection of seedling pears, originated by Messrs. F. & L. Clapp, and the strawberries and grapes originated by John B. Moore, in the past few years, we have confidence in expressing the opinion that the time is not far distant, when we shall see many more valuable new seedling fruits exhibited on our tables.

STRAWBERRIES.—Some very fine forced strawberries were exhibited by James Comley, March 10th, and again on March 24th and 31st, Mr. Comley being the only person who has shown forced strawberries in any amount during the season. Strawberries grown in frames under glass were shown by Charles Garfield, May 26th and June 2d. The season was very favorable for the strawberry, and the exhibition of this fruit has been up to the average of the past few seasons. Those most worthy of note, were the General Sherman, Hervey Davis, and Belle, shown by John B. Moore, and the Belle and Col. Cheney, shown by George Hill. At the Rose Show, June 20th, the first prize for the best four quarts of any variety, was awarded to the Hervey Davis, and the second to the General Sherman.

At the Strawberry Show, June 27th, the first prize for the best four quarts of any variety, was awarded to the Belle. We wish again to call attention to the very remarkable success Mr. Moore has had in raising seedlings, he having originated the General Sherman, Belle, and Hervey Davis. The last was shown in 1876, as No. 26, and for a description of the same, reference is made to the report of that year, page 87. The General Sherman is an early fruit, very large and handsome; quality, good. The Hervey Davis is also a very large fruit; quality, very good to best. Mr. Moore thinks this the most valuable seedling he has raised, as it is very hardy and prolific; it is an early variety. The Belle is the largest of any of Mr. Moore's seedlings, and we think it the largest strawberry ever exhibited on our tables. It is not as regular in form as the other two, many of the berries being inclined to the cockscomb shape; the quality is good. Much has been said in favor of the Monarch of the West, Star of the West, and the Great American, but we believe either of those raised by Mr. Moore is in all respects superior to any of them.

There have been but few seedlings exhibited for the first time this season, and none worthy of any particular note, except one shown by John B. Moore, which he has named Walden, and which

we think may prove very valuable, as it is of good size and very good quality.

CHERRIES.—The season has been favorable for this fruit, and the exhibitions have been very good. C. E. Grant exhibited the following varieties June 27th: Black Heart, Elton, Black Tartarian, and Black Eagle. James Nugent showed Walshs' No. 4. July 7th, Marshall P. Wilder exhibited two new seedlings, one of them from seed of the Downer's Late, though not quite as good in quality, but may still prove valuable as a late variety. July 14th, C. N. Brackett exhibited two seedlings, Nos. 1 and 2. No. 1 was considered much superior to the other, and may be called good. Warren Fenno exhibited his seedling Norfolk; this is considered the best cherry shown during the season.

CURRANTS.—The exhibitions of this fruit have been better than last season. They have been made by about the same persons, and of the same varieties. The first prize for the best four varieties was awarded to the following collection shown by C. M. Atkinson: Victoria, La Versaillaise, Dana's Transparent and Black Naples. The specimens of Victoria, which has not been shown before for some years, were very handsome, and gave evidence of the most skilful cultivation.

GOOSEBERRIES.—The exhibitions of this fruit, particularly the foreign varieties, have been better than the past few years. The fruit has been very large, handsome, and well ripened, and very free from mildew, which is generally the trouble in growing foreign varieties in this country.

RASPBERRIES.—The exhibitions of this fruit were not up to the average of the past few seasons, though better than last year; the varieties about the same. July 21st, the first prize was awarded to the Saunders, and the second to the Herstine. The Franconia has been much better this season, than the previous year. Marshall P. Wilder exhibited some specimens of a variety not often seen, the Souchetii.

BLACKBERRIES.—The exhibitions of this very valuable fruit have improved somewhat from last season, but not as much as we desire to see them. There has been some very fine fruit shown this year. The dish of Wilson's Early, exhibited by Messrs. F. & L. Clapp, July 28th, was very large and fine. James Nugent has also shown some very good Dorchesters. The other varieties have not been as good as in former seasons.

PLUMS.—The exhibition of Plums has been about up to the average of the past few seasons. Stiles Frost has shown some very fine specimens during the year, and was awarded the first and second prizes, August 25th, for Prince's Yellow Gage and Lombard. August 18th, Warren Fenno received the first prize for Washington. At the Annual Exhibition, the first prize was given to Stiles Frost, for Reine Claude de Bavay.

NECTARINES.—The only specimens of this fruit were shown by John Falconer, who received the first and second prizes, for Albert Victor and Reine Victoria. They were very fine specimens, grown in the orchard house.

FIGS.—There is not much interest taken in growing or exhibiting this fruit, Mrs. Benjamin Fobes being the only person showing any during the season.

PEACHES.—We have nothing to report on forced peaches, none of the prizes having been awarded. Peaches of orchard-house culture were shown at the Annual Exhibition by John Falconer, who made a very fine display, taking all the premiums offered with the following varieties: first prize for Stump the World; second, for Rivers' Princess of Wales; third, for Richmond; fourth, for Raymackers. These were all very handsome specimens. The display of out-door peaches was better than last season; the Foster peach received the first prize for a single dish, and there were more of this variety on our tables than of any other, showing that the season has been favorable for them, or else people are growing them in preference to other varieties. Seedlings were shown by Philander Ames and Warren Fenno.

APPLES.—We are obliged to report the poorest display of apples during the season that has been made for a large number of years, and we think it can be accounted for by the uncommonly small crop in this and all the New England States. We are aware that this is what is called the "off year," or, in other words, the year that most of the orchards in this section of the country yield a very small crop. We give the number of dishes of the different varieties, for comparison with last year: —

Baldwin, . . .	11	Gravenstein, . . .	6
Dutch Codlin, . . .	4	Hubbardston, . . .	7
Fall Orange, . . .	1	King of Tompkins County,	3
Golden Russet, . .	1	Lyscom, ...	1

Maiden's Blush, . .	2	Pumpkin Sweet, . .	1
Minister, . . .	1	R. I. Greening, . .	2
Mother, ...	3	Roxbury Russet, . .	9
Northern Spy, . .	1	Washington Strawberry, .	1
Porter, ...	8		

The above list comprises sixty-two dishes; and last year, at our Annual Exhibition, we had one hundred and seventy-six dishes.

July 7th, Marshall P. Wilder presented some specimens of Haines' Seedling apple, from M. Cole & Co., of Atlanta, Ga. The fruit was not in a perfect condition for trial, being partly decayed from being sent so long a distance at that season of the year. It was very large and handsome; quality, good; not unlike the Gravenstein in flavor.

It gives us much pleasure to acknowledge the receipt on the 15th of December, from the Fruit Growers' Association and International Show Society, of Halifax, Nova Scotia, from which we have before received similar favors, of the largest and finest collection of apples placed on our tables this year. They were mostly gathered from the orchard of Robert W. Starr, the Secretary of the Society, and that of his brother. We regret very much that owing to their having been gathered and packed for some time, a portion of the specimens, particularly the early varieties, were decayed and not in a condition to test. The Committee considered the collection a remarkably fine one for any section, and more particularly so as coming from so far East, and where the season is so short and cold. We desire to mention a few of the varieties, which were extra fine: Blue Pearmain, King of Tompkins County, Blenheim Pippin, Ribston Pippin, Yellow Bellflower, Cabashea or Twenty Ounce *Pippin*, Rose, Alexander, Fallawater, Starratt, Cayuga Red Streak or Twenty Ounce *Apple*, and Red Cheek or Monmouth Pippin. We think the above-named varieties were quite as good as the same varieties grown in the New England States. We were much gratified to see for the first time, Cox's Orange Pippin, an apple of English origin, and a favorite variety in England. It is of medium size, roundish; yellow, streaked and clouded with red; flesh, yellow and very rich. It ripens from October to February. As a whole this collection of apples was much less ribbed than those generally received from Nova Scotia. None of them were striking in this respect except the White Calville, which is always much ribbed wherever grown. This evenness of form is accounted for by the

fact that the collection was originally made for the purpose of modelling from, and perfection of form and color were sought rather than size, which ruled in the collection sent in 1874.

PEARS.—It gives us much pleasure to be able to report a very fine display of this fruit during the entire season. At the weekly shows and at the Annual Exhibition, prizes were offered, as last year, only for single dishes. We are satisfied that this is the best method of offering and awarding prizes, as in all cases the best fruit receives the premiums, if the judgment of the Committee is correct. The varieties most worthy of particular mention this season are the Bartlett, Souvenir du Congrès, Duchesse, Winter Nelis, and Doyenne du Comice. At the Annual Exhibition the show of Bartletts was one of the best ever made by this Society, there being twenty-eight dishes, and most of them very fine. The four dishes receiving the prizes weighed, respectively, 9 lbs. 3¼ ozs., 9 lbs. 2 ozs., 9 lbs. ½ oz., and 8 lbs. 15½ ozs. The pears which attracted most attention at the Annual Exhibition were the Souvenir du Congrès, from Warren Fenno. These were the finest specimens of the kind ever shown here, averaging a little over a pound each in weight, and the largest measuring seven inches in length. For the information of the many who were so much interested in this superb dish of pears we will say, that in quality the variety will rank as "very good," and that the tree is a very vigorous grower. At the Annual Exhibition, A. J. Coe, of West Mendon, Conn., presented two specimens each of Beurre d'Anjou, Beurre Superfin, Lawrence, Vicar, and Winter Nelis. These were all quite large, but not as handsome or of as good shape as many dishes of the same varieties shown by other persons.

At the exhibition on the 6th of October, the most remarkable display was of the Duchesse; there being twenty-six dishes, most of them very fine; the three dishes receiving the several premiums weighed as follows: 13 lbs. 5½ ozs., 13 lbs. 4¾ ozs., 13 lbs. 4 ozs., and several of the other dishes were nearly as large.

November 3, M. Morse had a remarkable dish of Doyenne du Comice. November 10th, at the annual show of winter pears, the display was very fine—much above the average of the past few years. We think we can say without any doubt, that the dish of Winter Nelis, receiving the first prize, was the largest and handsomest dish of this variety ever shown at any of our exhibitions, and we think we can challenge California to produce a dish that

would equal it in size and beauty. The weight was 7½ lbs. December 1st, Alexander Greenlaw exhibited a very fine dish of Winter Nelis; December 13th, A. S. M'Intosh a fine dish of Glout Morceau, and Mrs. H. V. Draper a good dish of Columbia.

On the 13th of October, Marshall P. Wilder presented the Docteur Lentier, a new variety. Large, obovate pyriform, somewhat irregular; pale greenish yellow, with dots and splashes of thin russet, continuous around the eye and stem. Flesh white; fine grained, buttery, very juicy, sprightly and very sweet, with a pleasant aroma, and sometimes a little astringency. Quality, best.

October 27th, Mr. Wilder presented specimens of the following varieties, for the Committee to test their quality:

Emile d'Heyst.—This, we consider best in quality, and it is also large and handsome. It has been cultivated by Mr. Wilder for quite a number of years, but is not as widely known as it deserves to be; we think it should take the place of many varieties of its season not nearly as good in quality.

President.—One of Dr. Shurtleff's seedlings: large; quality very good; it promises to be a valuable pear for market.

Roitelet.—Quality good.

January 27th, Marshall P. Wilder left with the Committee for trial, specimens, of the growth of 1876, of a seedling pear from B. S. Fox, of California, which he has named Col. Wilder. The fruit was very much wilted, but we think that if properly kept until in eating order, it might be melting and buttery, and rank as very good. September 29th, a large collection of seedlings raised by Mr. Fox was received, through Mr. Wilder, for exhibition and trial. Many of them arrived in bad condition, owing to their having been exhibited at the meeting of the American Pomological Society at Baltimore, and could not be fairly tested. The following are brief descriptions of some of the best varieties:

Fox's No. 64.—Medium size, or large; elongated pyriform; colored throughout with rich brownish red; resembles Bishop's Thumb in appearance; juicy and rich; a little too astringent; very good.

No. 52. Hardly medium size; pyriform; russet, with reddish cheek; juicy, sweet and good.

No. 153.—Medium size; obovate; yellow with thin russet and mottled red cheek, juicy; rich and very good, but a little too astringent.

No. 159.—Large, resembling the B. S. Fox (another of Mr. Fox's seedlings, which bears his name), in form and insertion of stem; also in color; more spirited and also more astringent.

No. 253.—Medium size; oblate; stem an inch and a half in length; yellow, juicy and good.

No. 157.—Large, green, with bloom; shaped like Glout Morceau; knobby, like Thompson, and ugly; rich, with flavor and texture resembling a greenflesh melon.

The Francis Dana pear was shown by Eliphalet Stone, at the Annual Exhibition. This was one of several seedlings, given to Mr. Stone, when young plants, by the late Francis Dana, and which he has named in memory of the originator. Full medium size; globular acute pyriform; skin, clear lemon yellow, with tracings of thin russet. In general appearance it resembles the Howell. Flesh, buttery, juicy, and of very good quality, but will not come up to best. Ripens the last of September. "Yellows up" very handsomely, and it is thought may become a valuable market pear.

October 20th, F. & L. Clapp, exhibited some of their seedlings or new varieties. No. 75, from Winter Nelis, we do not think any improvement over the parent. No. 127, from Urbaniste, was in quality very good to best. No. 22, or Frederick Clapp, will rank as best in quality, and the dish shown this year we think the finest ever exhibited. No. 12, or Newhall, was also very fine. No. 17, or Nicholas, was very good. All of the above seedlings have been described in previous reports. December 15, Messrs. Clapp presented a fine dish of their seedling, No. 17, which will rank as very good, and which we think will be valuable for market.

November 10th, Asahel Foote, of Williamstown, sent a dish of his seedling pear, Homestead, described in the "Second Appendix" to "Downing's Fruits of America." Pyriform; medium to large; quality good. There have been several other seedlings shown during the season, but none worthy of particular note, excepting one presented by Hovey & Co., November 10th; fruit medium to large, roundish, color russet, thickly covered with brownish dots; very juicy, but rather too acid.

Premiums were offered for forty different varieties of pears at the Annual Exhibition. The number of dishes of each variety offered for prizes was as follows:

Adams,	1	Flemish Beauty,	8
Andrews,	9	Goodale,	4
Bartlett,	28	Glout Morceau,	7
Belle Lucrative,	15	Howell,	16
Beurre d'Anjou,	20	Lawrence,	14
Beurre Bosc,	15	Louise Bonne of Jersey,	25
Beurre Clairgeau,	10	Marie Louise,	10
Beurre Diel,	11	Merriam,	11
Beurre Gris d'Hiver,	4	Moore's Pound,	2
Beurre Hardy,	17	Mount Vernon,	6
Beurre Langelier,	5	Onondaga,	11
Beurre Superfin,	12	Paradis d'Automne,	9
Buffum,	10	Pratt,	3
Caen du France,	4	Sheldon,	28
Dana's Hovey,	15	Souvenir du Congrès,	2
De Tongres,	6	Seckel,	28
Doyenne Boussock,	8	St. Michael Archangel,	7
Duchesse,	21	Urbaniste,	14
Doyenne du Comice,	12	Vicar,	6
Fulton,	6	Winter Nelis,	12

NATIVE GRAPES.—The show of this fruit has been about equal to the average of the past few seasons. Moore's Early was shown August 25th, by John B. Moore, and awarded a First Class Certificate of Merit. The fruit was well colored, but not fully ripe. September 1st, Moore's Early received the first prize for the best early grape. Champion was shown by Marshall P. Wilder. September 8th, Moore's Early, Concord, Delaware, and Hartford, received the prizes for early varieties, in the order named. September 29th, H. E. Hooker exhibited the Brighton grape. This is considered a very fine grape, and a valuable acquisition. The specimens shown were equal to any before exhibited. We do not see any reason to change our previous good opinion of it, if it proves hardy in all locations. It has been described in previous reports.

September 4th, Mr. Moore extended an invitation to the Fruit Committee and other gentlemen, to visit his place in order to examine his seedling grape, Moore's Early, and to compare it with the Concord and Hartford, growing side by side in the same vineyard, with the same soil and cultivation. We found the Moore's

Early fully ripe, and bearing an abundant crop on all of the vines, comprising several hundred. To all appearance they had not received any extra care or cultivation. The soil was a light, sandy loam. The Concords and Hartfords were neither of them ripe, and to all appearance would not be for two or three weeks. Mr. Moore has offered this grape for the Prospective Prize, for the best seedling grape. Your Committee have seen the fruit on exhibition for five years previous to this; it having been first exhibited in 1872. It has received the first prize for the best early grape every year for the last four years. The Committee have also seen it growing in the vineyard the past two seasons, and are fully and unanimously of the opinion that Mr. Moore is entitled to the prize for which he has offered it. Your Committee would, therefore, unanimously recommend to the Society, that John B. Moore be awarded the prize of sixty dollars for his seedling grape, Moore's Early.

The exhibition of grapes on the 6th of October, was very good. The Concords shown by Mr. Blanchard were very fine bunches — very large and well shouldered, but not as ripe or as sweet as those shown last year. The Crevelings shown by B. G. Smith, were the best we have ever seen of that variety; the bunches were very large and full, which is not common with this kind. The Worden Grape was shown by A. F. Rice.

N. B. White has exhibited several of his seedlings during the season. We have nothing to say of them different from what has been said in previous reports.

Foreign Grapes.—The exhibition of foreign grapes has been as good during the season, as for the past few years. At the annual exhibition, B. G. Smith received the first prize for the best six varieties; Henry C. Cook, for the best four; E. W. Wood, for the best three, and Stiles Frost for the best two. All of the above mentioned collections contained some very fine bunches, and most of the fruit was well grown and well ripened. H. S. Mansfield and E. H. Luke had some very fine fruit in their collections.

Oranges, etc.—February 10th, Miss Marion C. Allen, exhibited some very fine oranges, and again, on the 2d of June. She has been the only person exhibiting this fruit during the season. August 11th, Hovey & Co., exhibited a very fine spike of fruit of *Musa Cavendishii* (Dwarf Banana), containing a large number of specimens, and well grown.

At the Annual Exhibition, the number of dishes of the several fruits was as follows:

Number of dishes of	Pears,	. . .	637
" "	Apples,	. . .	74
" "	Foreign Grapes,	. .	36
" "	Native "	. .	57
" "	Peaches,	. .	46
" "	Nectarines,	. .	2

Making in all, 852 dishes, of all varieties of fruit. In 1876, there were 1,011 dishes.

Premiums and gratuities have been awarded to one hundred and forty different persons. The annexed list of awards shows the amount of prizes to be $1,288; gratuities $336; total, $1,624; balance unexpended, $276. The above mentioned amount of premiums includes the Prospective Prize of $60, awarded to John B. Moore, for his seedling grape, Moore's Early. The large unexpended balance is mainly due to the fact that, owing to the small crop of apples, few prizes have been awarded for that fruit.

All of which is respectfully submitted.

HERVEY DAVIS,
P. B. HOVEY,
JOHN B. MOORE,
BENJ. G. SMITH,
E. W. WOOD,
C. F. CURTIS,
D. T. CURTIS,

Fruit Committee.

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

January 6.

Winter Pears.—For the best, to J. H. Fenno, for Josephine de Malines,	$3 00
For the second best, to John L. Bird, for Winter Nelis,	2 00
Winter Apples.—For the best, to William T. Hall, for Northern Spy,	3 00
For the second best, to Asa Clement, for Baldwin,	2 00

Gratuities:—

To John L. Bird, for Passe Colmar Pears,	1 00
W. P. Walker, for Easter Beurre Pears,	1 00
B. G. Smith, for Pears,	1 00
F. & L. Clapp, for Seedling Pears, No. 64,	1 00
Asa Clement, for collection of Apples,	2 00
Edwin Fletcher, " " "	2 00
Benjamin P. Ware, for " "	2 00
J. H. Fenno, for Apples,	1 00

January 13.

Gratuity:—

To O. B. Hadwen, for collection of Apples,	2 00

February 3.

Winter Pears.—For the best, to Joseph H. Fenno, for Josephine de Malines,	3 00
For the second best, to Joseph H. Fenno, for Duchesse de Bordeaux,	2 00
Winter Apples.—For the best, to Willlam T. Hall, for Northern Spy,	3 00
For the second best, to Asa Clement, for Fallawater,	2 00

Gratuities:—

To Miss A. C. Wheeler, for Beurre d'Anjou Pears, .	$1 00
O. B. Hadwen, for collection of Apples, . .	2 00
Asa Clement, " " " . .	2 00
Samuel Hartwell, " " " . .	2 00
Joseph H. Fenno, " Apples, ...	1 00

FEBRUARY 10.

Gratuity:—

To Miss Marion C. Allen, for Oranges, ...	2 00

MARCH 3.

WINTER PEARS.—For the best, to Joseph H. Fenno, for Duchesse de Bordeaux, ...	3 00
For the second best, to Joseph H. Fenno, for Easter Beurre, ...	2 00
WINTER APPLES.—For the best, to William T. Hall, for Northern Spy, ...	3 00
For the second best, to Samuel Hartwell, for Hunt Russet, ...	2 00

Gratuities:—

To C. E. Grant, for Apples and Pears, ...	1 00
B. G. Smith, for Pears, ...	2 00
F. & L. Clapp, for Seedling Pears, No. 64, . .	2 00
Samuel Hartwell, for Apples, ...	1 00
Miss A. C. Wheeler, for Apples, ...	1 00

MARCH 10.

Gratuity:—

To James Comley, for Forced Strawberries, . . .	3 00

MARCH 24.

Gratuities:—

To James Comley, for Strawberries, ...	3 00
O. B. Hadwen, for collection of Apples, . . .	2 00

MARCH 31.

Gratuities:—

To James Comley, for Strawberries, ...	1 00
J. H. Fenno, for Apples and Pears, . . .	2 00

APRIL 7.

Gratuities: —

To R. Manning, for Apples and Pears,	$2 00
C. E. Grant, " " " "	2 00
Mrs. C. N. S. Horner, for collection of Apples,	2 00
Samuel Hartwell, for Apples,	2 00
Miss A. C. Wheeler, for Apples,	1 00
James Comley, for Strawberries,	2 00

MAY 26.

Gratuity: —

To Charles Garfield, for Strawberries,	3 00

JUNE 2.

GRAPES.—For the best two bunches, to Peter Smith, for Black Hamburg,	10 00
For the second best, to Peter Smith, for Zinfindal,	6 00
STRAWBERRIES.—For the best, to Charles Garfield, for Triomphe de Gand,	5 00

Gratuities: —

To Miss Marion C. Allen, for Lemons and Oranges,	2 00
Cephas H. Brackett, for Forced Peaches,	2 00

JUNE 9.

Gratuity: —

To Charles Garfield, for Strawberries,	1 00

JUNE 16.

Gratuities: —

To John B. Moore, for Hervey Davis and Gen. Sherman Strawberries,	5 00
E. P. Richardson, for Jenny Lind and Downer's Prolific Strawberries,	2 00
Warren Fenno, for Brighton Pine Strawberries,	1 00
Aaron D. Capen, for Charles Downing Strawberries,	1 00
Charles Garfield, for collection of Strawberries,	2 00
C. E. Grant, " " "	1 00
Wm. C. Child, " " "	2 00

ROSE SHOW.

June 20.

Strawberries.—For the best four quarts to John B. Moore, for Hervey Davis,	$8 00
For the second best, to John B. Moore, for Gen. Sherman,	6 00
For the third best, to George Hill, for Col. Cheney,	4 00
For the best two quarts, to C. M. Atkinson, for Jucunda,	4 00
For the second best, to J. C. Park, for Seth Boyden,	3 00
For the third best, to W. P. Walker, for Triomphe de Gand,	2 00
Forced Grapes.—Third prize for two bunches, to Cephas H. Brackett, for Black Hamburg,	3 00

Gratuities: —

To William C. Child, for collection of Strawberries,	3 00
C. E. Grant, " " "	2 00
Aaron D. Capen, for Charles Downing Strawberries,	1 00
E. P. Richardson, for Grace Strawberries,	1 00

June 23.

Gratuities: —

To John B. Moore, for Strawberries,	4 00
E. P. Richardson, " "	1 00
George Dorr, for Monarch of the West Strawberries,	1 00
Charles H. Wall, for Lennig's White "	1 00
C. E. Grant, for Cherries,	1 00

STRAWBERRY SHOW.

June 27.

Strawberries.—For the best four quarts, to John B. Moore, for Belle,	$10 00
For the second best, to George Hill, for Belle,	8 00
For the third best, to John B. Moore, for President Wilder,	6 00

For the best fifty berries, to John B. Moore, for Belle,	$5 00
For the second best, to John B. Moore, for Walden,	3 00
For the best two quarts of Caroline, to John B. Moore,	4 00
For the second best, to E. P. Richardson, . .	3 00
For the best Champion, to E. P. Richardson, . .	3 00
For the second best, to J. C. Park, . . .	2 00
For the best Charles Downing, to J. C. Park, . .	3 00
For the second best, to John B. Moore, . .	2 00
For the best Col. Cheney, to J. C. Park, . . .	4 00
For the best Gen. Sherman, to John B. Moore, . .	4 00
For the best Hovey's Seedling, to Hovey & Co., . .	4 00
For the best Jenny Lind, to E. P. Richardson, . .	3 00
For Jucunda, the third prize, to C. E. Grant, . .	2 00
For the best President Wilder, to Horace Eaton, .	4 00
For the second best, to J. B. Moore, . . .	3 00
For the third best, to Marshall P. Wilder, . .	2 00
For the best Seth Boyden, to John C. Park, . .	3 00
For Triomphe de Gand, the second prize to W. P. Walker, ...	3 00
CHERRIES:—For the best four varieties, to C. E. Grant, for Black Heart, Black Eagle, Elton, and Black Tartarian, ...	6 00
For the best two quarts, to I. P. Langworthy, for Knight's Early Black, ...	4 00
For the second best, to C. E. Grant, for Black Tartarian, ...	3 00
For the third best, to James Nugent, for Walsh's No. 4, ...	2 00
Gratuities:—	
To John C. Park, for Belle and Monarch of the West Strawberries, ...	3 00
Warren Fenno, for Monarch of the West Strawberries,	1 00
Horace Eaton, for Great American " .	1 00
John B. Moore, for trusses of Belle and Walden Strawberries, ...	2 00
Charles H. Wall, for Lennig's White Strawberries, .	2 00
H. C. Bowers, for Agriculturist " .	2 00
W. P. Walker, for Triomphe de Gand " .	1 00
E. P. Richardson, for collection of " .	2 00

To C. E. Grant, for collection of Strawberries, . . $2 00
Cephas H. Brackett, for Foreign Grapes, . . . 3 00
Aaron D. Capen, for collection of Cherries, . . 2 00
F. R. Shattuck, for Black Tartarian Cherries, . . 1 00
C. E. Grant, for Napoleon Bigarreau Cherries, . . 1 00

JULY 7.

CHERRIES.—For the best two quarts, to T. S. Lockwood, for Coe's Transparent, ... 4 00
For the second best, to George Dorr, for Downer's Late, ... 3 00
For the third best, to C. E. Grant, for Black Eagle, 2 00
STRAWBERRIES.—For the best two quarts to John B. Moore, for Belle, ... 4 00
For the second best, to John B. Moore, for Walden, 3 00

Gratuities:—

To E. P. Richardson, for Brinckle's Orange Raspberries, 2 00
Mrs. E. M. Gill, for Raspberries, ... 1 00
Warren Fenno, for Black Cap Raspberries and Currants, ... 2 00
B. G. Smith, for Currants, ... 2 00
W. K. Wood, " " 2 00

JULY 14.

RASPBERRIES.—For the best two quarts, to Warren Fenno, for Saunders, ... 4 00
For the second best, to William G. Prescott, for Franconia, ... 3 00
For the third best, to Warren Fenno, for Herstine, . 2 00
CURRANTS.—For the best four quarts of Red, to W. K. Wood, for La Versaillaise, ... 4 00
For the second best, to B. G. Smith, for La Versaillaise, ... 3 00
For the third best, to C. M. Atkinson, for La Versaillaise, ... 2 00
For the best four quarts of White, to B. G. Smith, for Transparent, ... 3 00
For the second best, to C. E. Grant, for White Dutch, ... 2 00

Gratuities:—

To C. N. Brackett, for Cherries,	$2 00
Warren Fenno, for Cherries and Currants,	2 00
Charles Garfield, for Currants and Raspberries,	2 00
Charles H. Hall, " " " "	2 00
C. M. Atkinson, for White Currants,	1 00
E. W. Mitchell, for Currants,	1 00
C. E. Grant, " "	1 00
Mrs. E. M. Gill, " "	1 00

JULY 21.

RASPBERRIES.—For the best two quarts, to J. B. Moore, for Saunders,	4 00
For the second best, to Warren Fenno, for Herstine,	3 00
For the third best, to Warren Fenno, for Saunders,	2 00
CURRANTS.—For the best collection, to C. M. Atkinson, for Victoria, La Versaillaise, Dana's Transparent, and Black Naples,	5 00
For the second best, to B. G. Smith, for Cherry, La Versaillaise, Transparent, and Black Naples,	3 00
For the best four quarts, to B. G. Smith, for La Versaillaise,	4 00
For the second best, to W. K. Wood, for La Versaillaise,	3 00
For the third best, to Mrs. E. M. Gill, for La Versaillaise,	2 00
GOOSEBERRIES.—For the best two quarts, to Charles Garfield, for Roaring Lion,	4 00
For the second best, to B. G. Smith, for Smith's Improved,	3 00
For the third best, to Charles Garfield, for Whitesmith,	2 00

Gratuities:—

To Marshall P. Wilder, for Souchetii Raspberries,	1 00
William G. Prescott, for Franconia Raspberries,	2 00
Charles Garfield, " " "	1 00
Mrs. E. M. Gill, " " "	1 00
John B. Moore, for Raspberries and Gooseberries,	2 00
C. E. Grant, for collection of Currants,	2 00

JULY 28.

BLACKBERRIES.—For the best, to F. & L. Clapp, for Wilson's Early,	$3 00
For the second best, to James Nugent, for Dorchester,	2 00
PEARS.—For the best Doyenne d'Eté, to Horace Eaton,	3 00
For the second best, to W. P. Walker,	2 00
For the third best, to Warren Fenno,	1 00

Gratuities:—

To Charles Garfield, for Royal George Gooseberries,	1 00
A. S. M'Intosh, for Dorchester Blackberries,	1 00
B. G. Smith, for " "	1 00
W. C. Child, for Kittatinny "	1 00
Warren Fenno, for Herstine Raspberries,	1 00
C. D. Kingman, for Foster Peaches,	2 00
Robert Manning, for Petit Muscat Pears,	1 00

AUGUST 4.

PEARS.—For the best Beurre Giffard, to Josiah Crosby,	3 00
For the second best, to Warren Fenno,	2 00
For the third best, to B. G. Smith,	1 00
For the best Doyenne d'Eté, to Warren Fenno,	3 00
For the second best, to George S. Harwood,	2 00
For the third best, to W. P. Walker,	1 00
For the best of any other variety, to Marshall P. Wilder, for Suprême de Quimper,	2 00
For the second best, to Warren Fenno, for Bloodgood,	1 00
APPLES.—For the best Large Yellow Bough, to Benj. B. Davis,	3 00
For the second best, to Warren Heustis,	2 00
For the best Early Harvest, to B. G. Smith,	3 00
For the second best, to Warren Fenno,	2 00
GOOSEBERRIES.—For the best two quarts of Native, to B. G. Smith, for Downing,	3 00

Gratuities:—

To C. N. Brackett, for Beurre Giffard Pears,	1 00
C. D. Kingman, for collection of Peaches,	3 00
J. Falconer, for Peaches and Apricots,	2 00

To B. G. Smith, for Gooseberries and Apples, . . $2 00
Robert Manning, for Amber Gooseberries, . . 1 00
Charles Garfield, for Gooseberries and Blackberries, . 2 00

AUGUST 11.

GOOSEBERRIES.—For the best two quarts of Foreign, to B. G. Smith, for Bang-up, ... 3 00
APPLES.—For Large Yellow Bough, the second prize to G. M. Mellen, ... 2 00
For Red Astrachan, the second prize to J. T. Foster, 2 00
Third prize to H. T. Andrews, ... 1 00
For the best Williams, to B. G. Smith, . . . 3 00
For the second best, to George Hill, . . . 2 00
For the third best, to John Cummings, . . . 1 00
For the best of any other variety, to T. M. Davis, for Summer Harvey, ... 3 00
PEARS.—For the best Beurre Giffard, to John Fillebrown, 3 00
For the second best, to Warren Fenno, . . . 2 00
For the third best, to William T. Hall, . . . 1 00
For the best of any other variety, to Marshall P. Wilder, for Suprême de Quimper, . . . 3 00
For the second best, to C. N. Brackett, for Brandywine, ... 2 00
For the third best, to Hovey & Co., for Brandywine, 1 00
BLACKBERRIES.—For the best, to James Nugent, for Dorchester, ... 3 00

Gratuities:—

To Charles Garfield, for Blackberries and Gooseberries, . 1 00
J. Cruickshanks, for Moorpark Apricots, . . . 1 00
C. D. Kingman, for collection of Peaches, . . 2 00
Marshall P. Wilder, for collection of Pears, . . 2 00
Hovey & Co., for spike of fruit of *Musa Cavendishii* (Dwarf Banana), ... 5 00

AUGUST 18.

PLUMS.—For the best dish, to Warren Fenno, for Washington, ... 3 00
For the second best, to Stiles Frost, for Prince's Yellow Gage, ... 2 00

PEARS.—For the best Clapp's Favorite, to F. & L. Clapp,	$4 00
For the second best, to Horace Eaton, . . .	3 00
For the third best, to Hovey & Co., . . .	2 00
For the fourth best, to T. M. Davis, . . .	1 00
For the best of any other variety, to Warren Fenno, for Brandywine, ...	4 00
For the second best, to C. M. Atkinson, for Brandywine, ...	3 00
For the third best, to Marshall P. Wilder, for Sterling, ...	2 00
For the fourth best, to Alexander Dickinson, for Dearborn's Seedling, ...	1 00
FIGS.—The second prize to Mrs. Benjamin Fobes, for Brown Turkey, ...	2 00
Gratuities:—	
To James Nugent, for Dorchester Blackberries, . . .	1 00
A. S. M'Intosh, for Clapp's Favorite Pears, . .	1 00
B. G. Smith, for Williams Apples, ...	1 00
J. L. D. Sullivan, for Peaches, ...	1 00
Edward Davenport, for Hale's Early Peaches, . .	1 00
J. T. Foster, for Lawn Peaches, ...	1 00
J. Cruickshanks, for Moorpark Apricots, . . .	1 00

AUGUST 25.

PEARS.—For the best Bartlett, to Alexander Dickinson, .	4 00
For the second best, to W. P. Walker, . . .	3 00
For the third best, to Horace Partridge, . . .	2 00
For the fourth best, to John McClure, . . .	1 00
For the best Boston, to Hovey & Co., . . .	3 00
For the best Rostiezer, to John McClure, . . .	3 00
For the second best, to Horace Eaton, . . .	2 00
For the third best, to J. T. Foster, . . .	1 00
For the best Tyson, to A. S. M'Intosh, . . .	3 00
For the second best, to Walker & Co., . . .	2 00
For the third best, to Hovey & Co., . . .	1 00
For the best Clapp's Favorite, to F. & L. Clapp, .	4 00
For the second best, to A. S. M'Intosh, . .	3 00
For the third best, to Edward Davenport, . .	2 00
For the fourth best, to John McClure, . . .	1 00

PLUMS.—For the best dish, to Stiles Frost, for Prince's Yellow Gage,	$3 00
For the second best, to Stiles Frost, for Lombard,	2 00
PEACHES.—For the best dish, to Alexander Dickinson, for Hale's Early,	4 00
For the second best, to J. T. Foster, for Laura,	3 00
FIGS.—The second prize to Mrs. Benjamin Fobes, for Brown Turkey,	1 00

Gratuities:—

To Hovey & Co., for collection of Pears,	2 00
Warren Heustis, for Bartlett Pears,	1 00
B. G. Smith, for Pears,	1 00

SEPTEMBER 1.

APPLES.—For the best, to G. M. Mellen, for Gravenstein,	4 00
For the second best, to Warren Fenno, for Gravenstein,	3 00
PEARS.—For the best Bartlett, to George S. Harwood,	4 00
For the second best, to C. N. Brackett,	3 00
For the third best, to Hovey & Co.,	2 00
For the fourth best, to Alexander Dickinson,	1 00
For the best of any other variety, to Warren Fenno, for Brandywine,	4 00
For the second best, to B. G. Smith, for Duchesse de Berri,	3 00
For the third best, to W. P. Walker, for Belle Lucrative,	2 00
For the fourth best, to A. S. M'Intosh, for Tyson,	1 00
NATIVE GRAPES.—For the best six bunches of any variety, to John B. Moore, for Moore's Early,	4 00
For the second best, to J. W. Talbot, for Cottage,	3 00
For the third best, to Marshall P. Wilder, for Champion,	2 00

Gratuities:—

To C. E. Grant, for Pears and Grapes,	2 00
W. T. Hall, for Pears and Apples,	2 00
I. A. Morton, for Clapp's Favorite Pears,	1 00

To F. & L. Clapp, for Seedling Pear, No. 36, for its size and beauty, ... $2 00
G. M. Mellen, for Apples, ... 1 00
J. L. D. Sullivan, for Seedling White Nectarine, . 1 00
Miss A. C. Wheeler, for Seedling Peaches, . . 1 00
Stiles Frost, for collection of Plums, . . . 2 00

SEPTEMBER 8.

APPLES.—For the best Gravenstein, to William T. Hall, 3 00
For the second best, to Walter Russell, . . . 2 00
For the third best, to G. M. Mellen, . . . 1 00
For the best Porter, to W. P. Walker, . . . 3 00
For the second best, to C. L. Weston, . . . 2 00
For the third best, to G. M. Mellen, . . . 1 00
For the best of any other variety, to Warren Fenno, for Maiden's Blush, ... 3 00
For the second best, to C. N. Brackett, for Pumpkin Sweet, ... 2 00
PEARS.—For the best Andrews, to Horace Partridge, . 3 00
For the second best, to Alexander Dickinson, . . 2 00
For the third best, to C. E. Grant, ... 1 00
For the best Belle Lucrative to Alexander Dickinson, . 3 00
For the second best, to W. T. Andrews, . . . 2 00
For the third best, to Walker & Co., . . . 1 00
For the best Doyenne Boussock, to O. B. Hadwen, . 3 00
For the second best, to E. W. Wood, . . . 2 00
For the third best, to T. M. Davis, . . . 1 00
For the best of any other variety, to Walker & Co., for St. Michael Archangel, ... 3 00
For the second best, to Alexander Dickinson, for Stevens' Genesee, ... 2 00
For the third best, to W. P. Walker, for Doyenne Robin, ... 1 00
NATIVE GRAPES.—For the best of any variety, to John B. Moore, for Moore's Early, ... 4 00
For the second best, to Charles H. Wall, for Concord, 3 00
For the third best, to C. E. Grant, for Delaware, . 2 00
For the fourth best, to Charles Garfield, for Hartford Prolific, ... 1 00

PEACHES.—For the best, to J. T. Foster, for Foster, .	$4 00
For the second best, to Joshua Crane, for Foster .	3 00
For the third best, to W. T. Andrews, for Crawford's Early, ...	2 00
For the fourth best, to Samuel Hartwell, for Crawford Early, ...	1 00

Gratuities: —

To Benjamin F. Hunt, for collection of Pears, . .	2 00
C. N. Brackett, " " " " . . .	2 00
G. M. Mellen, for Flemish Beauty Pears, . . .	1 00
Warren Fenno, for Peaches and Pears, . . .	2 00
Dr. C. H. Johnson, for " " " . . .	1 00
Joseph L. Chase, for Smith's Orleans Plums, . .	1 00
C. D. Kingman, for Foreign Grapes, . . .	2 00

ANNUAL EXHIBITION.

SEPTEMBER 18, 19, 20, AND 21.

APPLES.—For the best Baldwin, to B. G. Smith, . .	$4 00
For the second best, to J. T. Foster, . . .	3 00
For the third best, to Walter Russell, . . .	2 00
For the fourth best, to C. N. Brackett, . . .	1 00
For the best Dutch Codlin, to William T. Hall, . .	3 00
For the second best, to S. N. Gaut, . . .	2 00
For the best Fall Orange, to O. B. Hadwen, . .	3 00
For the best Gravenstein, to Walter Russell, . .	4 00
For the second best, to F. & L. Clapp, . . .	3 00
For the third best, to William T. Hall, . . .	2 00
For the fourth best, to Warren Heustis, . . .	1 00
For the best Hubbardston Nonsuch, to Walter Russell,	4 00
For the second best, to J. T. Foster, . . .	3 00
For the third best, to Josiah Crosby, . . .	2 00
For the fourth best, to C. N. Brackett, . . .	1 00
For the best Hunt Russet, to George Dorr, . .	4 00
For the second best, to C. L. Weston, . . .	3 00
For the best King of Tompkins County, to Hovey & Co.,	4 00
For the second best, to C. N. Brackett, . . .	3 00
For the third best, to Warren Fenno, . . .	2 00

For the best Lyscom, to O. B. Hadwen,	$3 00
For the best Maiden's Blush, to Warren Fenno,	3 00
For the best Minister, to William T. Hall,	3 00
For the best Northern Spy, to John W. Esterbrook,	4 00
For the second best, to Warren Fenno,	3 00
For the best Porter, to G. M. Mellen,	4 00
For the second best, to Walter Russell,	3 00
For the third best, to W. P. Walker,	2 00
For the fourth best, to J. T. Foster,	1 00
For the best Pumpkin Sweet, to Joseph Parker,	4 00
For the best Rhode Island Greening, to J. L. DeWolf,	4 00
For the second best, to Warren Fenno,	3 00
For the best Roxbury Russet, to John L. DeWolf,	4 00
For the second best, to S. N. Gaut,	3 00
For the third best, to Warren Heustis,	2 00
For the fourth best, to William A. Crafts,	1 00
For the best Washington Strawberry, to Warren Fenno,	3 00
PEARS.—For the best Adams, to Hovey & Co.,	3 00
For the best Andrews, to Horace Partridge,	4 00
For the second best, to S. G. Damon,	3 00
For the third best, to S. P. Langmaid,	2 00
For the best Bartlett, to S. P. Langmaid,	4 00
For the second best, to William R. Austin,	3 00
For the third best, to William A. Crafts,	2 00
For the fourth best, to John McClure,	1 00
For the best Belle Lucrative, to Isaac Oliver,	4 00
For the second best, to S. P. Langmaid,	3 00
For the third best, to Alexander Dickinson,	2 00
For the fourth best, to Augustus Parker,	1 00
For the best Beurre d'Anjou, to William R. Austin,	4 00
For the second best, to Timothy Corey,	3 00
For the third best, to S. P. Langmaid,	2 00
For the fourth best, to W. S. Janvrin,	1 00
For the best Beurre Bosc, to Augustus Parker,	4 00
For the second best, to William R. Austin,	3 00
For the third best, to Warren Fenno,	2 00
For the fourth best, to T. M. Davis,	1 00
For the best Beurre Clairgeau, to John L. DeWolf,	4 00
For the second best, to John Fillebrown,	3 00
For the third best, to Warren Fenno,	2 00

For the fourth best, to William R. Austin,	$1 00
For the best Beurre Diel, to Alexander Dickinson,	3 00
For the second best, to W. S. Janvrin,	2 00
For the third best, to John L. DeWolf,	1 00
For the best Beurre Gris d' Hiver Nouveau, to Warren Fenno,	3 00
For the second best, to Hovey & Co.,	2 00
For the best Beurre Hardy, to William R. Austin,	4 00
For the second best, to Edward Hyde,	3 00
For the third best, to A. S. M'Intosh,	2 00
For the fourth best, to Mrs. H. P. Kendrick,	1 00
For the best Beurre Langelier, to C. E. Grant,	3 00
For the second best, to W. P. Walker,	2 00
For the third best, to John L. Bird,	1 00
For the best Beurre Superfin, to T. M. Davis,	4 00
For the second best, to John C. Park,	3 00
For the third best, to Lewis Slack,	2 00
For the fourth best, to A. Dickinson,	1 00
For the best Buffum, to Marshall P. Wilder,	3 00
For the second best, to Horace Partridge,	2 00
For the best Caen du France, to Marshall P. Wilder,	3 00
For the second best, to C. E. Grant,	2 00
For the third best, to Amos Bates,	1 00
For the best Dana's Hovey, to Alexander Dickinson,	4 00
For the second best, to Hovey & Co.,	3 00
For the third best, to J. W. Merrill,	2 00
For the fourth best, to Eben Snow,	1 00
For the best De Tongres, to C. E. Grant,	3 00
For the second best, to T. M. Davis,	2 00
For the third best, to John L. Bird,	1 00
For the best Doyenne Boussock, to Hovey & Co.,	3 00
For the second best, to Marshall P. Wilder,	2 00
For the third best, to John L. DeWolf,	1 00
For the best Doyenne du Comice, to George S. Harwood,	4 00
For the second best, to William A. Craft,	3 00
For the third best, to Warren Fenno,	2 00
For the fourth best, to W. P. Walker,	1 00
For the best Duchesse d'Angouleme, to A. Dickinson,	4 00
For the second best, to J. F. Nickerson,	3 00

For the third best, to W. S. Janvrin,	$2 00
For the fourth best, to Mrs. H. P. Kendrick,	1 00
For the best Flemish Beauty, to C. E. Grant,	3 00
For the second best, to E. H. Luke,	2 00
For the third best, to J. F. Nickerson,	1 00
For the best Fulton, to J. C. Park,	3 00
For the second best, to C. N. Brackett,	2 00
For the third best, to J. T. Foster,	1 00
For the best Glout Morceau, to J. F. Nickerson,	3 00
For the second best, to Mrs. H. P. Kendrick,	2 00
For the third best, to J. Dana Hovey,	1 00
For the best Goodale, to C. E. Grant,	3 00
For the second best, to Warren Fenno,	2 00
For the third best, to Marshall P. Wilder,	1 00
For the best Howell, to W. S. Janvrin,	4 00
For the second best, to Jesse Haley,	3 00
For the third best, to J. C. Park,	2 00
For the fourth best, to David W. Stowers,	1 00
For the best Lawrence, to S. P. Langmaid,	3 00
For the second best, to Warren Fenno,	2 00
For the third best, to Eben Snow,	1 00
For the best Louise Bonne of Jersey, to Timothy Corey,	4 00
For the second best, to S. P. Langmaid,	3 00
For the third best, to Alexander Dickinson,	2 00
For the fourth best, to John McClure,	1 00
For the best Marie Louise, to Hovey & Co.,	4 00
For the second best, to Alexander Dickinson,	3 00
For the third best, to John L. De Wolf,	2 00
For the fourth best, to Walker & Co.,	1 00
For the best Merriam, to Josiah Crosby,	4 00
For the second best, to Timothy Corey,	3 00
For the third best, to S. G. Damon,	2 00
For the fourth best, to A. S. M'Intosh,	1 00
For the best Moore's Pound, to A. Dickinson,	3 00
For the second best, to Hovey & Co.,	2 00
For the best Mount Vernon, to Walker & Co.,	3 00
For the second best, to A. McDermott,	2 00
For the best Onondaga or Swan's Orange, to A. McDermott,	4 00
For the second best, to J. F. Nickerson,	3 00

For the third best, to Warren Fenno, . . . $2 00
For the fourth best, to John McClure, . . . 1 00
For the best Paradis d' Automne, to Hovey & Co., . 3 00
For the second best, to Marshall P. Wilder, . . 2 00
For the third best, to John L. Bird, . . . 1 00
For the best Pratt, to Hovey & Co., ... 3 00
For the second best to Marshall P. Wilder, . . 2 00
For the best Seckel, to Mrs. H. P. Kendrick, . . 4 00
For the second best, to George S. Harwood, . . 3 00
For the third best, to Mrs. E. M. Gill, . . . 2 00
For the fourth best, to John Fillebrown, . . . 1 00
For the best Sheldon, to George S. Harwood, . . 4 00
For the second best, to C. N. Brackett, . . . 3 00
For the third best, to Horace Eaton, . . . 2 00
For the fourth best, to W. S. Janvrin, . . . 1 00
For the best Souvenir du Congrès, to Warren Fenno, . 3 00
For the second best, to Marshall P. Wilder, . . 2 00
For the best St. Michael Archangel, to Jesse Haley, . 4 00
For the second best, to Hovey & Co., . . . 3 00
For the third best, to T. M. Davis, . . . 2 00
For the fourth best, to A. Dickinson, . . . 1 00
For the best Urbaniste, to Timothy Corey, . . 4 00
For the second best, to Hovey & Co., . . . 3 00
For the third best, to William A. Crafts, . . 2 00
For the fourth best, to Walker & Co., . . . 1 00
For the best Vicar of Winkfield, to W. S. Janvrin, . 3 00
For the second best, to John McClure, . . . 2 00
For the third best, to Horace Eaton, . . . 1 00
For the best Winter Nelis, to S. G. Damon, . . 3 00
For the second best, to W. P. Walker, . . . 2 00
For the third best, to John L. Bird, . . . 1 00
PEACHES.—For the best dish, to J. T. Foster, for Foster, 4 00
For the second best, to Horace Eaton, for Oldmixon, 3 00
For the third best, to J. F. Nickerson, for Foster, . 2 00
For the best dish, of orchard house culture, to John Falconer, for Stump the World, ... 5 00
For the second best to John Falconer, for River's Prince of Wales, ... 4 00
For the third best, to John Falconer, for Richmond, 3 00
For the fourth best, to John Falconer, for Raymacker's, ... 2 00

NECTARINES.—For the best dish, to John Falconer, for Albert Victor,	$4 00
For the second best, to John Falconer, for Reine Victoria,	3 00
PLUMS.—For the best dish, to Stiles Frost, for Reine Claude de Bavay,	3 00
For the second best, to Stiles Frost, for Schuyler's Gage,	2 00
NATIVE GRAPES.—For the best Adirondac, to S. G. Damon,	3 00
For the best Concord, to N. Blanchard,	4 00
For the second best, to Joseph S. Chase,	3 00
For the third best, to M. Muldoon,	2 00
For the best Delaware, to E. Myrick,	3 00
For the second best, to Thomas S. Lockwood,	2 00
For the third best, to Warren Fenno,	1 00
For the best Hartford, to J. W. Talbot,	3 00
For the second best, to S. G. Damon,	2 00
For the third best, to John B. Moore,	1 00
For the best Israella, to S. G. Damon,	3 00
For the best of any other early variety, to J. B. Moore, for Moore's Early,	3 00
For the second best, to Benjamin G. Smith, for Creveling,	2 00
For the third best, to E. Myrick, for Eumelan,	1 00
FOREIGN GRAPES.—For the best six varieties, to Benjamin G. Smith, for Golden Hamburg, Wilmot's Hamburg, Black Hamburg, Muscat Hamburg, Lady Downe's Seedling, and Red Chasselas,	12 00
For the second best, to H. S. Mansfield, for Golden Hamburg, Black Hamburg, Muscat of Alexandria, Royal Muscadine, Black Prince, and Red Chasselas,	10 00
For the best four varieties, to Henry C. Cook, for Victoria Hamburg, Black Hamburg, Rose Chasselas, and Chasselas de Fontainbleau,	8 00
For the best three varieties, to E. W. Wood, for Victoria Hamburg, Black Hamburg, and Golden Hamburg,	6 00
For the second best, to Augustus Parker, for Muscat of Alexandria, Muscat Hamburg, and Black Hamburg,	5 00

For the third best, to E. H. Luke, for Muscat Hamburg, Black Hamburg, and Buckland Sweetwater,	$4 00
For the best two varieties, to Stiles Frost, for Black Hamburg and Wilmot's Hamburg, . . .	5 00
For the second best, to C. E. Grant, for Black Hamburg and White Chasselas, ...	4 00
For the third best, to B. G. Smith, for Victoria Hamburg and Red Chasselas, ...	3 00
For the best two bunches of any White Grape, to H. S. Mansfield, for White Frontignan, . . .	5 00
For the second best, to Daniel Curtin, for White Chasselas, ...	4 00

Gratuities for Pears:—

To M. W. Chadbourne, for collection, ...	3 00
Benj. F. Hunt, " "	3 00
F. J. Baxter, " "	2 00
John Cummings, " "	2 00
William C. Child, " "	2 00
C. E. Grant, " "	2 00
Frank M. Gilley, " "	2 00
C. N. Brackett, " "	2 00
J. B. Moore, " "	2 00
Horace Partridge, " "	2 00
James Cruickshanks, " "	2 00
S. N. Gaut, " "	1 00
Josiah Crosby, " "	1 00
S. A. Merrill, " "	1 00
Mrs. F. Nichols, " "	1 00
Parker Barnes, " "	1 00
Mrs. H. P. Kendrick, for Kingsessing Pears, . .	1 00
Miss H. M. Young, for Dana's America Pears, .	1 00
Walker & Co., for Walker Pears, ...	1 00
D. W. Lothrop, for Seedling Pear, ...	1 00

Gratuities for Peaches:—

To William C. Child, ...	2 00
Joseph S. Chase, ...	1 00
Philander Ames, ...	1 00
Amos Nickerson, ...	1 00

To Warren Fenno,	$1 00
J. Dana Hovey,	1 00

Gratuities for Grapes, etc.:—

To B. G. Smith, for Foreign Grapes	2 00
John B. Moore, for collection of Native Grapes,	2 00
M. H. Merriam, for Diana,	1 00
Eben Snow, for Iona,	1 00
N. B. White, for Native Grapes,	1 00
G. F. Waters, for Fall Harvey Apples,	1 00
Miss Sarah W. Story, for Fruit Design,	2 00

SEPTEMBER 29.

Gratuities:—

To Lewis Slack, for collection of Pears,	2 00
George H. Rogers, for Seckel Pears,	1 00
John C. Newton, for St. Michael Pears,	1 00
Asa Bullard, for Duchesse Pears,	1 00
C. E. Grant, for Pears and Grapes,	1 00
G. M. Mellen, for Porter Apples,	1 00

OCTOBER 6.

PEARS.—For the best Beurre Bosc, to T. M. Davis,	4 00
For the second best, to Warren Fenno,	3 00
For the third best, to S. N. Gaut,	2 00
For the best Beurre Clairgeau, to Jesse Haley,	4 00
For the second best, to John Fillebrown,	3 00
For the third best, to S. G. Damon,	2 00
For the best Beurre Diel, to T. M. Davis,	4 00
For the second best, to E. L. Draper,	3 00
For the third best, to R. W. Ames,	2 00
For the best Doyenne du Comice, to Warren Fenno,	4 00
For the second best, to Hovey & Co.,	3 00
For the third best, to J. C. Park,	2 00
For the best Duchesse, to A. Dickinson,	4 00
For the second best, to J. V. Wellington,	3 00
For the third best, to T. M. Davis,	2 00
For the best Louise Bonne of Jersey, to John McClure,	4 00
For the second best, to A. Dickinson,	3 00
For the third best, to T. M. Davis,	2 00

For the best Urbaniste, to John L. Bird,	$4 00
For the second best, to Jesse Haley,	3 00
For the third best, to Hovey & Co.,	2 00
APPLES.—For the best Fall Orange, to Charles Stearns,	3 00
For the best Gravenstein, to F. & L. Clapp,	3 00
For the second best, to Charles Stearns,	2 00
For the best Porter, to G. M. Mellen,	3 00
For the second best, to S. N. Gaut,	2 00
For the best Washington Strawberry, to Warren Fenno,	3 00
NATIVE GRAPES.—For the best Agawam, to C. E. Grant,	3 00
For the second best, to C. F. Holt,	2 00
For the best Catawba, to C. E. Grant,	3 00
For the best Concord, to N. Blanchard,	3 00
For the second best, to Cephas H. Brackett,	2 00
For the best Creveling, to B. G. Smith,	3 00
For the second best, to S. G. Damon,	2 00
For the best Diana, to Augustus Torrey,	3 00
For the second best, to J. F. Heustis,	2 00
For the best Iona, to Eben Snow,	3 00
For the second best, to S. G. Damon,	2 00
For the best Isabella, to J. V. Wellington,	3 00
For the second best, to W. T. Andrews,	2 00
For the best Wilder, to S. G. Damon,	3 00
For the second best, to Mrs. E. M. Gill,	2 00
For the best Massasoit, to S. G. Damon,	3 00
FOREIGN GRAPES:—For the best three varieties, to E. W. Wood,	5 00
For the second best, to B. G. Smith,	4 00
For the best two bunches, to B. G. Smith,	3 00
For the second best, to E. W. Wood,	2 00
QUINCES:—For the best, to Charles Bird,	3 00
For the second best, to W. S. Janvrin,	2 00
For the third best, to Mrs. S. Joyce,	1 00

Gratuities:—

To A. S. M'Intosh, for Pears,	2 00
Warren Fenno, " "	2 00
R. Manning, " "	2 00
Mrs. E. M. Gill, " "	1 00
S. A. Hall, " "	1 00

To Asa Bullard, for Pears,	$1 00
John L. Bird, " "	1 00
John McClure, " "	1 00
James Cruickshanks, for collection of Pears,	2 00
C. E. Grant, " " " "	2 00
J. C. Park, " " " "	2 00
Miss Sarah Story, " " " "	1 00
T. M. Davis, " " " "	1 00
Mrs. H. V. Draper, for Pears and Grapes,	2 00
S. N. Gaut, for Apples and Pears,	2 00
William C. Child, for Apples,	1 00
J. B. Moore, for Peaches,	1 00
C. D. Chamberlain, for Seedling Peaches,	1 00
Charles Leeds, for Seedling Peach,	1 00
B. G. Smith, for Foreign Grapes,	2 00
A. F. Rice, for Worden Grapes,	1 00

OCTOBER 13.

Gratuities:—

To George E. Freeman, for Sheldon Pears,	2 00
William E. Coffin, for Glout Morceau Pears,	1 00
William G. Prescott, for Seedling Pear,	1 00
Joseph Gardner, for Beurre Diel Pears,	1 00
James Marble, for Gloria Mundi Apples,	1 00

OCTOBER 20.

Gratuities:—

To C. E. Grant, for collection,	2 00
F. & L. Clapp, for collection of Seedling Pears,	5 00
I. G. Dearborn, for Peaches,	1 00

OCTOBER 27.

Gratuities:—

To William G. Prescott, for Urbaniste Pears,	1 00
G. M. Mellen, for Beurre Bosc Pears,	1 00
H. M. Young, for collection,	1 00

NOVEMBER 3.

Gratuity:—

To M. Morse, for Doyenne du Comice Pears,	1 00

NOVEMBER 10.

PEARS.—For the best Beurre d'Anjou, to Alexander Dickinson,	$3 00
For the second best, to John McClure,	2 00
For the best Caen du France, to Marshall P. Wilder,	3 00
For the second best, to Hovey & Co.,	2 00
For the best Dana's Hovey, to A. S. M'Intosh,	3 00
For the second best, to Jesse Haley,	2 00
For the best Lawrence, to J. V. Wellington,	3 00
For the second best, to W. S. Janvrin,	2 00
For the best Mount Vernon, to Walker & Co.,	3 00
For the second best, to A. McDermott,	2 00
For the best Winter Nelis, to F. C. Clouston,	3 00
For the second best, to T. M. Davis,	2 00

French Premiums.

APPLES.—For the best Baldwin, to J. T. Foster,	3 00
For the second best, to Mrs. E. M. Gill,	2 00
For the best Hubbardston Nonsuch, to Josiah Crosby,	3 00
For the second best, to J. T. Foster,	2 00
For the best Roxbury Russet, to J. T. Foster,	3 00
For the second best, to S. N. Gaut,	2 00

Gratuities:—

To Miss A. C. Wheeler, for collection of Grapes,	1 00
C. E. Grant, for Catawba Grapes,	1 00
Horace Partridge, for Grapes,	1 00
Warren Fenno, for collection of Pears,	3 00
A. S. M'Intosh, " " " "	2 00
A. Dickinson, " " " "	2 00
Edwin A. Hall, for Pears,	1 00
Mrs. Edward E. Menton, for Glout Morceau Pears,	2 00
Marshall P. Wilder, for Emile d'Heyst Pears,	1 00
M. Morse, for Doyenne du Comice Pears,	1 00
John L. Bird, for Easter Beurre Pears,	1 00

NOVEMBER 24.

Gratuity:—

To Hovey & Co., for collection of Pears,	2 00

DECEMBER 1.

Gratuities:—

To C. E. Grant, for collection of Pears,	$2 00
Alexander Greenlaw, for Winter Nelis Pears,	2 00

DECEMBER 15.

Gratuities:—

To A. S. M'Intosh, for Glout Morceau Pears,	1 00
Mrs. H. V. Draper, for Columbia Pears,	1 00
F. & L. Clapp, for Seedling Pears, No. 17,	1 00

The amount awarded to each contributor is as follows:

Allen, Miss M. C.	$4	Crafts, William A.	$8
Ames, Philander	1	Crane, Joshua	3
Andrews, W. T.	7	Crosby, Josiah	18
Atkinson, C. M.	15	Cruickshanks, James	6
Austin, William R.	15	Cummings, John	3
Barnes, Parker	1	Curtin, Daniel	4
Bates, Amos	1	Damon, S. G.	28
Baxter, J. F.	2	Davenport, Edward	3
Bird, Charles	3	Davis, B. B.	3
Bird, John L.	13	Davis, T. M.	38
Blanchard, Nathan	7	Dearborn, I. G.	1
Bowers, H. C.	2	DeWolf, John L.	16
Brackett, Cephas H.	10	Dickinson, Alexander	52
Brackett, Charles N.	24	Dorr, George	8
Bullard, Asa	2	Draper, E. L.	3
Capen, Aaron D.	4	Draper, H. V.	1
Chadbourne, M. H.	3	Eaton, Horace	19
Chamberlain, C. D.	1	Esterbrook, John W.	4
Chase, Joseph S.	5	Falconer, John	23
Child, William C.	11	Fenno, J. H.	17
Clapp, F. & L.	28	Fenno, Warren	97
Clement, Asa	8	Fillebrown, John	10
Clouston, F. C.	3	Fletcher, Edwin	2
Coffin, William E.	1	Fobes, Mrs. Benjamin	3
Comley, James	9	Foster, J. T.	31
Cook, Henry	8	Freeman, George E.	2
Corey, Timothy	14	Frost, Stiles	19

Garfield, Charles	$25	Menton, Mrs. Edward E.	$2
Gaut, S. N.	14	Merriam, M. H.	1
Gill, Mrs. E. M.	12	Merrill, J. W.	2
Gilley, Frank M.	2	M'Intosh, A. S.	20
Grant, C. E.	67	Mitchell, Edward M.	1
Greenlaw, Alexander	2	Moore, J. B.	92
Hadwen, O. B.	15	Morse, M.	2
Haley, Jesse	16	Morton, I. A.	1
Hall, E. A.	1	Muldoon, M.	2
Hall, S. A.	1	Myrick, E.	4
Hall, W. T.	23	Newton, John C.	1
Hartwell, Samuel	8	Nichols, Mrs. F.	1
Harwood, George S.	17	Nickerson, Amos	1
Heustis, J. F.	2	Nickerson, J. F.	12
Heustis, Warren	6	Nugent, James	8
Hill, George	14	Oliver, Isaac	4
Holt, C. F.	2	Park, John C.	30
Horner, Mrs. C. N. S.	2	Parker, Augustus	13
Hovey & Co.	62	Parker, Joseph	4
Hovey, J. Dana	2	Partridge, Horace	14
Hunt, B. F.	5	Prescott, William G.	7
Hyde, Edward	8	Rice, A. F.	1
Janvrin, W. S.	17	Richardson, E. P.	17
Johnson, Dr. C. H.	1	Rogers, George H.	1
Joyce, Mrs. S.	1	Russell, Walter	15
Kendrick, Mrs. H. P.	9	Shattuck, F. R.	1
Kingman, C. D.	9	Slack, Lewis	4
Langmaid, S. P.	17	Smith, B. G.	77
Langworthy, I. P.	4	Smith, Peter	16
Leeds, Charles	1	Snow, Eben	6
Lockwood, T. S.	6	Stearns, Charles	5
Lothrop, D. W.	1	Stowers, D. W.	1
Luke, E. H.	6	Sullivan, J. L. D.	2
Manning, Robert	6	Talbot, J. W.	6
Mansfield, H. S.	15	Torrey, Augustus	2
Marble, James	1	Walker & Co.	15
McClure, John	17	Walker, Wm. P.	26
McDermott, A.	8	Wall, Charles H.	8
Mellen, G. M.	19	Ware, Benjamin P.	2

Waters, George F. . .	$1	Wilder, Marshall P. .	$33
Wellington, J. V. . .	9	Wood, E. W. . . .	15
Weston, C. L. . .	5	Wood, W. K. . . .	8
Wheeler, Miss A. C. .	5	Young, H. M. . .	2
White, N. B. . . .	1		

Amount of appropriation, ...		$1,900
Prizes awarded, ...	$1,228	
Prospective Prize, to John B. Moore, . .	60	
Gratuities awarded, ...	336	
		1,624
Balance not awarded, ...		$276

REPORT

OF THE

Committee on Vegetables,

FOR THE YEAR 1877.

By C. N. BRACKETT, CHAIRMAN.

The Committee on Vegetables for the year 1877 report as follows:

The past season has been remarkably favorable for the production of fine vegetables. The various crops have been abundant, and the quality excellent.

With such a season and such crops we naturally look for corresponding results at our exhibitions, not only in the increased quantity and variety of the various specimens offered for competition, but also in their quality and improvement generally. In other words, a favorable season means a good exhibition season. So far as this department is concerned this expectation has been realized, and our shows of vegetables have been among the best ever made. From the commencement of the year to the opening exhibition, on the 7th of April, there were occasionally some very fine specimens of forced vegetables placed on exhibition in the Library Room, as has been the case in former years. These contributions, although limited in quantity in comparison with those of some previous years, nevertheless comprised the choicest specimens of the season, and furnished ample proof of care and skill in cultivation.

During the months of January, February, and March, we were indebted to the following contributors, to whom gratuities were awarded for the objects named: to Josiah Crosby, for Celery, Lettuce, Dandelions, Radishes, and Cucumbers; to Hovey & Co., for Mushrooms; to C. M. Atkinson, for Brussells Sprouts, Swiss

Chard, and Cauliflowers; to Cephas H. Brackett, for very fine specimens of Cucumbers, Mushrooms, and Rhubarb; to James Comley, for several varieties of Tomatoes, the first shown March 3, and continued at intervals up to June 20; to Walter Russell, for Lettuce, Cucumbers, and Radishes; to W. D. Philbrick, George Hill, George F. Stone, and George W. Pierce, for well grown specimens of Tennisball Lettuce.

The weekly shows, commencing April 7, have all been fine, many of them unusually so. Those of June 2d and 27th may be mentioned as among the best of the season. June 9, Mr. Levi Emery exhibited specimens of Victoria Rhubarb, a single stalk of which weighed 2 lbs. 11½ ozs. James Comley also had on exhibition, at this date, three varieties of Tomatoes, and George Dorr very fine samples of Princess Head Lettuce.

The show of Peas, during their season, was considered much superior to what we have usually seen in former years. The same remark will apply to Lima Beans, which have never before been shown in such perfection as during the past season. The first prize for this favorite bean, both at the weekly and annual shows, has invariably been taken by Benjamin G. Smith. In every case, however, competition has been spirited, and the prizes have been very closely contested. At the Annual Exhibition the number of competitors for this prize was twelve.

July 14, Joseph Tailby exhibited a new Pea, grown by him from seed received from Carter & Co., of London, under the name of Commander-in-Chief. It is an attractive variety, the pods being large and well filled, and is said to be very productive and of superior quality. It is considered promising, and is recommended for trial.

Notwithstanding the ravages of the Potato Beetle the past season, the potato crop has generally been abundant, of excellent quality, and far superior in all respects to the average of the past few years. At the Annual Exhibition the show of this esculent was thought to be one of the best ever made in the Hall. There were on exhibition at this time fifty-nine dishes, consisting mainly of the following varieties: Early Rose, Extra Early Vermont, Snow Flake, Brownell's Beauty, Jackson, Early Ohio, Bresee's Prolific, and Eureka. The largest contributors were Mrs. M. T. Goddard and John Cummings, the former taking the first prize for the best four varieties, and the latter all but one of the first prizes for the best

single dishes. The prize for the best collection of new seedlings was not awarded.

The first exhibition of Tomatoes of open culture was made on the 21st of July by Walter Russell, and the last on the 10th of November by C. E. Grant; the display in the interval between those dates having been varied in kind, profuse in quantity, and excellent quality. At the Annual Exhibition this favorite vegetable was largely represented, there being no less than seventy-three dishes of the finest specimens ever seen on our table at this season. Our space will not allow us to speak of all the varieties that were shown, or to give the names of the contributors; most of the varieties of recent introduction have already been spoken of in previous reports. The varieties most extensively cultivated are Boston Market, Gen. Grant, and Emery, and these have invariably taken the first prizes at all the exhibitions during the season.

Cauliflowers were not as fine as last year; the best were shown by John B. Moore and John Cummings.

At the Annual Exhibition the Squash family was well represented, and the show was pronounced the best ever made of this important vegetable. Seth W. Hathaway was awarded the first prizes for Marrow, Hubbard, Turban, and Marblehead.

The displays of Melons, Egg Plant, etc., were all remarkably full and fine. Of the different varieties of the Onion there were, on exhibition, forty-two dishes, each dish containing one peck. The first prize for the best three varieties was awarded to J. B. Moore.

At this exhibition J. J. H. Gregory showed a fine collection of Watermelons, his specimens of Haskell's Excelsior and Vick's Early taking the first and third prizes; the Mountain Sweet, exhibited by Mrs. M. T. Goddard taking the second. Good specimens of Phinney's Early were also shown by the same contributors. The Greenflesh varieties, shown by Walter Russell, J. B. Moore, and others, were also very good, considering the lateness of the season.

No special comments on the exhibition of the various root crops, — Beets, Parsnips, Carrots, etc.,—are deemed necessary; the displays have been as abundant in quantity and as satisfactory in quality as usual.

We would again caution competitors for the Society's prizes, against deviating from the conditions specified in the Schedule. All varieties should be correctly named, and should contain the

required number of specimens named in the Schedule,—no more and no less. Any deviation from these or other established rules disqualifies the contribution, and it becomes the duty of the Committee to reject such collections, no matter how meritorious they may otherwise be. As this disagreeable duty was several times imposed on your Committee during the past season, they desire to bring this subject particularly to the notice of contributors, that the mistake may not be repeated in future.

The attention of contributors is called to important changes and alterations in the Schedule of Prizes for the coming year. It will be seen, on referring to the Schedule, that the appropriation for prizes and gratuities for vegetables has again been reduced, the amount for the coming year being fixed at $750, a reduction of twenty-five per cent. from the present year.

In order to keep within the appropriation, the Committee, in making up the Schedule for 1878, have not only found it necessary to cut down most of the prizes from what they were the present year, but have also been obliged to drop the November exhibition entirely. This is of course to be regretted, but as the interests of the Society appear to demand it, and as it is believed to be but temporary, it is earnestly hoped that contributors will not allow their interest in our exhibitions to flag on this account, but will cheerfully acquiesce in a measure necessary to what every member should have at heart—the best interests of the Society.

We close our report with the following list of prizes and gratuities awarded by your Committee the past season.

All of which is respectfully submitted.

C. N. Brackett,
Walter Russell,
George W. Pierce,
J. Fillebrown,
Josiah Crosby,
Anthony Hatch,
Samuel Hartwell,
} *Vegetable Committee.*

PRIZES AND GRATUITIES FOR VEGETABLES.

JANUARY 6.

Gratuity:—

To Josiah Crosby, for Celery, ... $1 00

JANUARY 20.

Gratuity:—

To Hovey & Co., for Mushrooms, ... 1 00

JANUARY 27.

Gratuity:—

To W. D. Philbrick, for Lettuce, ... 2 00

FEBRUARY 3.

Gratuities:—

To C. M. Atkinson, for Brussells Sprouts, . . . 2 00
W. D. Philbrick, for Lettuce, ... 1 00

FEBRUARY 10.

Gratuity:—

To C. M. Atkinson, for collection, ... 3 00

FEBRUARY 17.

Gratuity:—

To Josiah Crosby, for Lettuce, ... 2 00

FEBRUARY 24.

Gratuities:—

To George W. Pierce, for Lettuce, ... 2 00
Josiah Crosby, " " 1 00

MARCH 3.

Gratuities:—

To Josiah Crosby, for collection, ... 2 00
George W. Pierce, for Lettuce, ... 1 00

To Cephas H. Brackett, for Mushrooms and Cucumbers, $4 00
James Comley for Tomatoes, ... 1 00
Walter Russell, for two varieties of Radishes, . . 2 00

MARCH 10.

Gratuities:—

To C. H. Brackett, for Cucumbers, Mushrooms, and Rhubarb, ... 3 00
Walter Russell, for Radishes, ... 1 00

MARCH 24.

Gratuities:—

To Josiah Crosby, for Lettuce and Radishes, . . 2 00
Walter Russell, " " " " . . . 2 00
George Hill, for Lettuce, ... 1 00
James Comley, for One Hundred Days Tomato (new), . 2 00
C. M. Atkinson, for Spinach and Rhubarb, . . 2 00

AZALEA EXHIBITION.

APRIL 7.

CUCUMBERS.—For the best pair, to James Bard, . . 4 00
For the second best, to C. H. Brackett, . . . 3 00
LETTUCE.—For the best four heads of Tennisball, to G. F. Stone, ... 4 00
For the second best, to C. Garfield, . . . 3 00
For the third best, to W. T. Andrews, . . . 2 00
RADISHES.—For the best four bunches of Long Scarlet, to George Hill, ... 3 00
PARSLEY.—For the best dish of two quarts, to George Hill, 3 00

Gratuities:—

To James Comley, for three varieties of Tomatoes: Gen. Grant, Boston Market, and One Hundred Days, 2 00
C. H. Brackett, for Mushrooms, ... 1 00
C. M. Atkinson, for Brussels Sprouts, . . . 1 00

APRIL 14.

Gratuity:—

To C. H. Brackett, for Cucumbers, ... 1 00

APRIL 28.

Gratuities:—

To Walter Russell, for collection, ...	$2 00
C. H. Brackett, for Cucumbers, ...	1 00

MAY 5.

Gratuities:—

To James Comley, for Tomatoes and Rhubarb, . .	3 00
Walter Russell for Radishes and Dandelions, . .	2 00

MAY 12.

Gratuities:—

To J. H. Bell, for Tennisball Lettuce (fine), . . .	1 00
James Comley, for Tomatoes, ...	1 00

MAY 19.

Gratuities:—

To John B. Moore, for Asparagus (fine), . . .	2 00
Samuel Hartwell, for Asparagus and Rhubarb, . .	2 00
Alexander Anderson, for Rhubarb, ...	1 00
George Dorr, for Rhubarb, ...	1 00
James Comley, for Tomatoes, ...	1 00

MAY 26.

Gratuities:—

To James Comley, for three varieties of Tomatoes, .	2 00
Alexander Anderson, for Victoria Rhubarb, . .	1 00

JUNE 2.

ASPARAGUS.—For the best four bunches, to J. B. Moore,	4 00
For the second best, to Samuel Hartwell, . .	3 00
For the third best, to L. W. Weston, . . .	2 00
CUCUMBERS.—For the best pair, to Josiah Crosby, . .	3 00
For the second best, to George Hill, . . .	2 00
For the third best, to C. H. Brackett, . . .	1 00
RHUBARB.—For the best twelve stalks, to Alexander Dickinson (17½ lbs.), ...	3 00
For the second best, to Samuel Hartwell (15 lbs.), .	2 00
For the third best, to L. W. Weston, . . .	1 00

Radishes.—For the best Long Scarlet, to Josiah Crosby,	$3 00
For the second best, to Walter Russell, . . .	2 00
For the best Turnip Rooted, to Walter Russell, . .	3 00
Lettuce.—For the best four heads, to George Hill, .	3 00
For the second best, to Josiah Crosby, . . .	2 00
For the third best, to C. M. Atkinson, . . .	1 00
For the best four heads of Boston Curled, to George Hill, ...	3 00
For the second best, to Josiah Crosby, . . .	2 00
Carrots.—For the best twelve Short Scarlet, to Josiah Crosby, ...	4 00

Gratuities:—

To William G. Prescott, for Rhubarb, ...	1 00
James Comley, for two varieties of Tomatoes, . .	1 00
Walter Russell, for French Breakfast Radishes, . .	1 00

June 9.

Gratuities:—

To George Dorr, for Princess Head Lettuce, . . .	1 00
C. M. Atkinson, for Lettuce, ...	1 00
Levi Emery, for Victoria Rhubarb, (weight of largest stalk, 2 lbs. 11½ ounces), ...	1 00
James Comley, for three varieties of Tomatoes, .	1 00
C. N. Brackett, for Dunnett's Triple Curled Parsley, .	1 00
A. S. M'Intosh, for Artichokes, ...	1 00

June 16.

Gratuities:—

To John B. Moore, for Alpha Peas, ...	1 00
C. E. Grant, for Philadelphia Extra Early Peas, .	1 00
M. W. Chadbourne, for Alpha and Caractacus Peas, .	2 00

June 20.

Gratuities:—

To Josiah Crosby, for collection of Vegetables, . .	3 00
Cephas H. Brackett, for Cucumbers, . . .	1 00
L. W. Weston, for Peas, ...	1 00
C. E. Grant, for Caractacus Peas, ...	1 00
M. W. Chadbourne, for Little Gem and other Peas, .	2 00

To Samuel Hartwell, for Asparagus and Peas, . . $2 00
C. D. Kingman, for Alpha Potatoes, . . . 2 00
James Comley, for Tomatoes, ... 1 00

JUNE 23.

Gratuities:—

To M. W. Chadbourne, for Advancer Peas, . . . 1 00
George Dorr, for very fine Lettuce, ... 1 00

STRAWBERRY SHOW.

JUNE 27.

PEAS.—For the best peck, to J. H. Bell, for Advancer, . $4 00
For the second best, to M. W. Chadbourne, for Advancer, ... 3 00
For the third best, to Samuel Hartwell, for Marrowfat, 2 00
BEETS.—For the best Turnip Rooted, to Walter Russell, for Dewing's, ... 3 00
For the second best, to Josiah Crosby, for Dewing's, 3 00
For the best Egyptian, to Josiah Crosby, . . . 4 00
CUCUMBERS.—For the best pair, to Josiah Crosby, for White Spine, ... 4 00
For the second best, to Walter Russell, for White Spine, ... 3 00
For the third best, to George Hill, for White Spine, 2 00
LETTUCE.—For the best of any variety, to George Dorr, for Royal Cape, ... 4 00
For the second best, to Josiah Crosby, for Tennisball, 3 00
For the third best, to J. H. Bell, for Black Seeded Tennisball, ... 2 00
CARROTS.—For the best twelve Short Scarlet, to Josiah Crosby, ... 4 00
For the best Intermediate, to Josiah Crosby, . . 3 00
For the second best, to Walter Russell, . . . 2 00
ONIONS.—For the best twelve, to Josiah Crosby, . . 4 00

Gratuities:—

To C. E. Grant, for collection of Peas, ... 1 00
J. H. Bell, for Long Warted Squashes, . . . 1 00
Walter Russell, for Parsley, ... 1 00

JULY 7.

CRANBERRY BEANS.—For the best peck, to Josiah Crosby,	$4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to Walter Russell, . . .	2 00
SQUASHES.—For the best four Summer, to George Hill, .	3 00
For the second best, to Walter Russell, . . .	2 00
PEAS.—For the best peck, to C. M. Atkinson, for Champion, ...	4 00
For the second best, to S. Hartwell, for Marrowfat,	3 00
For the third best, to L. W. Weston, " "	2 00
ONIONS.—For the best twelve, to Josiah Crosby, for White Portugal, ...	3 00
For the second best, to George Hill, for White Portugal, ...	2 00
For the third best, to C. M. Atkinson, for Potato, .	1 00
POTATOES.—For the best peck, to M. W. Chadbourne, for Early Rose, ...	4 00
For the second best, to C. D. Kingman, for Alpha, .	3 00
CABBAGES.—For the best four, to Josiah Crosby, for Wyman, ...	4 00
For the second best, to Walter Russell, for Wyman,	3 00
For the third best, to Josiah Crosby, for Wakefield,	2 00

Gratuities:—

To C. D. Kingman for Wax Beans, ...	1 00
Walter Russell, for Beets, ...	1 00
" " for collection of Beans, . . .	2 00
J. H. Bell, for collection, ...	2 00

JULY 14.

POTATOES.—For the best peck, to John B. Moore, for Early Rose, ...	4 00
For the second best, to J. H. Bell, for Early Rose, .	3 00
For the third best, to Warren Heustis, . . .	2 00

Gratuities:—

To Joseph Tailby, for Commander-in-Chief Peas, . .	2 00
L. W. Weston, for Laxton's Late Peas, . . .	1 00

To M. W. Chadbourne, for collection, ...	$1 00
Charles Garfield, " "	1 00
Josiah Crosby, " "	1 00
J. H. Bell, for Parsley, ...	1 00

JULY 21.

SWEET CORN.—For the best twelve ears, to W. C. Child,	4 00
For the second best, to C. E. Grant, for Crosby, .	3 00
For the third best, to C. E. Grant, for Tom Thumb,	2 00
SQUASHES.—For the best four Marrow, to Josiah Crosby,	4 00
CABBAGES.—For the best Drumhead, to George Hill, .	4 00
For the second best, to Walter Russell, . . .	3 00
BEANS.—For the best peck of Dwarf Horticultural, to Walter Russell, ...	3 00
TOMATOES.—For the best twelve, to Walter Russell, for Boston Market, ...	3 00

Gratuity:—

To E. W. Wood, for Tom Thumb Corn, . . .	1 00

JULY 28.

TOMATOES.—For the best twelve, to C. N. Brackett, for Emery, ...	4 00
For the second best, to George Hill, for Emery, .	3 00
For the third best, to C. N. Brackett, for Gen. Grant,	2 00
For the fourth best, to Walter Russell, " " "	1 00
SWEET CORN.—For the best twelve ears, to Josiah Crosby, for Crosby, ...	4 00
For the second best, to Walter Russell, for Crosby,	3 00
For the third best, to C. N. Brackett, " "	2 00
EGG PLANT.—For the best Black Pekin, to James Bard, .	4 00
Third prize, to Josiah Crosby, ...	2 00

Gratuities:—

To J. H. Bell, for Early Rose Potatoes, . . .	1 00
Mrs. E. M. Gill, for collection of Beans, . . .	1 00
John Cummings, for Boston Market Tomatoes, .	1 00
C. D. Kingman, for Tomatoes, ...	1 00
Walter Russell, for Cabbages, ...	1 00
M. W. Chadbourne, for collection, ...	1 00

AUGUST 4.

SQUASHES.—For the best four Marrow, to Josiah Crosby,	$4 00
For the second best, to George Hill, . . .	3 00
SWEET CORN.—For the best twelve ears, to Walter Russell,	4 00
For the second best, to J. H. Bell, ...	3 00
For the third best, to Samuel Hartwell, . . .	2 00
TOMATOES.—For the best twelve specimens of Gen. Grant, to C. N. Brackett, ...	3 00
For the second best, to George Hill, . . .	2 00
For the third best, to J. B. Moore, ...	1 00
For the best Boston Market, to John Cummings, .	3 00
For the second best, to J. B. Moore, . . .	2 00
For the third best, to G. M. Mellen, . . .	1 00
For the best of any other variety, to C. N. Brackett, for Emery, ...	3 00
For the second best, to R. W. Ames, for Paragon, .	2 00
For the third best, to J. B. Moore, for Canada Victor,	1 00

Gratuities:—

To Walter Russell, for Purple Egg Plant, . . .	2 00
J. H. Bell, for Cabbages and Peppers, . . .	1 00
C. E. Grant, for Lima Beans, ...	1 00

AUGUST 11.

EGG PLANT.—For the best four specimens of Black Pekin, to J. Bard, ...	3 00
For the best four specimens of Large Round Purple, to W. Russell, ...	4 00
GREENFLESH MELONS.—For four specimens, the second prize, to Walter Russell, ...	3 00
TOMATOES.—For the best twelve, of any variety, to C. N. Brackett, for Gen. Grant, ...	3 00
For the second best, to John Cummings, for Paragon,	2 00
For the third best, to C. N. Brackett, for Emery, .	1 00
BEANS.—For the best two quarts of Large Lima, to B. G. Smith, ...	4 00
For the second best, to C. E. Grant, . . .	3 00
For the third best, to W. C. Child, ...	2 00

Gratuities:—

To John B. Moore, for collection,	$3 00
Walter Russell, " "	2 00
John Cummings, for three varieties of Tomatoes,	2 00
Samuel Hartwell, for Burr's Corn,	1 00
C. N. Brackett, for Triumph Corn,	1 00

AUGUST 18.

GREENFLESH MELONS.—For the best four specimens of any variety, to Walter Russell,	3 00
PURPLE EGG PLANT.—For the best four specimens, to Walter Russell,	3 00
For the second best, to Josiah Crosby,	2 00

Gratuities:—

To Josiah Crosby, for Pekin Egg Plant,	1 00
James Comley, for Corn,	1 00
Walter Russell, " "	1 00
G. M. Mellen, for collection,	1 00
John Cummings, for collection of Tomatoes,	3 00
Benjamin G. Smith, for Sieva Beans,	1 00
W. C. Child, for Lima Beans,	1 00

AUGUST 25.

POTATOES.—For the best peck of any variety, to J. Cummings, for Early Rose,	3 00
For the second best, to John B. Moore, for Early Rose,	2 00
For the third best, to J. H. Bell, for Early Rose,	1 00
LIMA BEANS.—For the best two quarts, to B. G. Smith,	3 00
For the second best, to John B. Moore,	2 00
For the third best, to Samuel G. Stone,	1 00
PEPPERS.—For the best twelve specimens, to James Bard,	3 00
For the second best, to Walter Russell,	2 00
For the third best, to J. H. Bell,	1 00

Gratuities:—

To W. C. Child, for collection of Beans,	1 00
M. W. Chadbourne, for collection,	1 00
Walter Russell, " "	1 00
C. E. Grant, " "	1 00
John Cummings " "	1 00
Horace Partridge, for Potatoes,	1 00

SEPTEMBER 1.

LIMA BEANS.—For the best two quarts, to B. G. Smith, .	$3 00
For the second best, to J. B. Moore, . . .	2 00
For the third best, to C. E. Grant, ...	1 00
WATERMELONS.—For the best pair, to Isaac P. Dickinson,	4 00
For the second best, to Samuel Hartwell, for Mountain Sweet, ...	3 00
For the third best, to Samuel Hartwell, for Black Spanish, ...	2 00
GREENFLESH MELONS.—For the best four specimens, to John B. Moore, ...	3 00
For the second best, to J. H. Bell, ...	2 00
For the third best, to W. Russell, ...	1 00
CELERY.—For the best four roots, to Josiah Crosby, .	4 00
For the second best, to George Hill, . . .	3 00
PEPPERS.—For the best twelve specimens, to C. N. Brackett, ...	3 00
For the second best, to Walter Russell, . . .	2 00

Gratuities:—

To James Comley, for two varieties of Turnips, . .	2 00
Daniel Duffley, for collection of Egg Plants, . .	2 00
M. W. Chadbourne, for collection, ...	1 00
Mrs. E. M. Gill, " "	2 00
C. E. Grant, " "	1 00
Walter Russell, for Salsify and Corn, . . .	1 00

SEPTEMBER 8.

CELERY.—For the best four roots, to Josiah Crosby, .	4 00
SALSIFY.—For the best twelve specimens, to John Cummings, ...	3 00
For the second best, to Walter Russell, . . .	2 00
For the third best, to M. W. Chadbourne, . .	1 00
CAULIFLOWERS.—For the best four specimens, to J. B. Moore, ...	4 00

Gratuities:—

To Lewis Slack, for Canada Squashes, ...	1 00
John Cummings, for Sweet Corn, ...	1 00
Samuel Hartwell, for Parsley, ...	1 00

To D. R. Beckford, Jr., for collection, ...	$1 00
C. E. Grant, " "	2 00
C. N. Brackett, " "	1 00
Mrs. C. N. S. Horner, for collection of Beans, . .	1 00

ANNUAL EXHIBITION.

SEPTEMBER 18, 19, 20, AND 21.

BEETS.—For the best Turnip Rooted, to George F. Stone,	$4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to John Fillebrown, . . .	2 00
CARROTS.—For the best Long Orange, to Walter Russell,	3 00
For the second best, to Josiah Crosby, . . .	2 00
For the third best, to W. W. Rawson, . . .	1 00
For the best Intermediate, to Josiah Crosby, . .	3 00
For the second best, to Walter Russell, . . .	2 00
For the third best, to George Russell, . . .	1 00
CORN.—For the best Sweet, to George Dorr, . .	4 00
For the second best, to Samuel G. Stone, . .	3 00
For the third best, to Samuel Hartwell, . . .	2 00
For the best Field Corn, to Mrs. M. T. Goddard, .	4 00
For the second best, to C. N. Brackett, . . .	3 00
For the third best, to Horace Eaton, . . .	2 00
CAULIFLOWERS.—For the best four specimens, to J. B. Moore, ...	4 00
For the second best, to John Cummings, . .	3 00
CELERY.—For the best four roots, to Josiah Crosby, .	4 00
For the second best, to George Hill, . . .	3 00
For the third best, to John Fillebrown, . . .	2 00
TOMATOES.—For the best three varieties, to J. Cummings,	5 00
For the second best, to J. Cummings, . . .	4 00
For the third best, to Walter Russell, . . .	3 00
For the best Arlington, to J. Cummings, . . .	3 00
For the best Boston Market, to J. Cummings, . .	3 00
For the best Emery, to J. J. H. Gregory, . . .	3 00
For the best Gen. Grant, to C. E. Grant, . . .	3 00
For the best of any other variety, to J. J. H. Gregory, for Paragon, ...	3 00
OKRA.—For the best twenty-four specimens, to Mrs. M. T. Goddard, ...	3 00

MARTYNIAS.—For the best twenty-four specimens, to Walter Russell,	$3 00
For the second best, to G. W. Pierce,	2 00
For the third best, to J. H. Bell,	1 00
CRANBERRIES.—For the best half-peck, to A. T. Brown,	4 00
For the second best, to C. N. Brackett,	3 00
GREENFLESH MELONS.—For the best four specimens, to Walter Russell,	4 00
For the second best, to J. B. Moore,	3 00
For the third best, to George F. Stone,	2 00
MUSKMELONS.—For the best four specimens, to J. H. Bell,	4 00
For the second best, to S. A. Merrill,	3 00
WATERMELONS.—For the best pair, to J. J. H. Gregory,	4 00
For the second best, to Mrs. M. T. Goddard,	3 00
For the third best, to J. J. H. Gregory,	2 00
BEANS.—For the best two quarts of Large Lima, to B. G. Smith,	4 00
For the second best, to George Hill,	3 00
For the third best, to C. E. Grant,	2 00
PARSNIPS.—For the best twelve specimens, to J. L. DeWolf,	4 00
For the second best, to W. A. Crafts,	3 00
For the third best, to W. W. Rawson,	2 00
POTATOES.—For the best four varieties, to Mrs. M. T. Goddard,	5 00
For the second best, to John Cummings,	4 00
For the third best, to John Cummings,	3 00
For the best peck of Bresee's Prolific, to J. Cummings,	2 00
For the best Brownell's Beauty, to J. Cummings,	2 00
For the second best, to Walter Russell,	1 00
For the best Early Rose, to J. Cummings,	2 00
For the second best, to J. B. Moore,	1 00
For the best Jackson, to C. N. Brackett,	2 00
For the second best, to John Cummings,	1 00
For the best Snow Flake, to John Cummings,	2 00
For the second best, to John L. DeWolf,	1 00
For the best peck of any other variety, to J. Cummings, for Eureka,	2 00
For the second best, to Mrs. M. T. Goddard, for Hardy's Seedling,	1 00

To D. R. Beckford, Jr., for collection, ...	$1 00
C. E. Grant, " "	2 00
C. N. Brackett, " "	1 00
Mrs. C. N. S. Horner, for collection of Beans, . .	1 00

ANNUAL EXHIBITION.

SEPTEMBER 18, 19, 20, AND 21.

BEETS.—For the best Turnip Rooted, to George F. Stone,	$4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to John Fillebrown, . . .	2 00
CARROTS.—For the best Long Orange, to Walter Russell,	3 00
For the second best, to Josiah Crosby, . . .	2 00
For the third best, to W. W. Rawson, . . .	1 00
For the best Intermediate, to Josiah Crosby, . .	3 00
For the second best, to Walter Russell, . . .	2 00
For the third best, to George Russell, . . .	1 00
CORN.—For the best Sweet, to George Dorr, . .	4 00
For the second best, to Samuel G. Stone, . .	3 00
For the third best, to Samuel Hartwell, . . .	2 00
For the best Field Corn, to Mrs. M. T. Goddard, .	4 00
For the second best, to C. N. Brackett, . . .	3 00
For the third best, to Horace Eaton, . . .	2 00
CAULIFLOWERS.—For the best four specimens, to J. B. Moore, ...	4 00
For the second best, to John Cummings, . .	3 00
CELERY.—For the best four roots, to Josiah Crosby, .	4 00
For the second best, to George Hill, . . .	3 00
For the third best, to John Fillebrown, . . .	2 00
TOMATOES.—For the best three varieties, to J. Cummings,	5 00
For the second best, to J. Cummings, . . .	4 00
For the third best, to Walter Russell, . . .	3 00
For the best Arlington, to J. Cummings, . . .	3 00
For the best Boston Market, to J. Cummings, . .	3 00
For the best Emery, to J. J. H. Gregory, . . .	3 00
For the best Gen. Grant, to C. E. Grant, . . .	3 00
For the best of any other variety, to J. J. H. Gregory, for Paragon, ...	3 00
OKRA.—For the best twenty-four specimens, to Mrs. M. T. Goddard, ...	3 00

MARTYNIAS.—For the best twenty-four specimens, to Walter Russell,	$3 00
For the second best, to G. W. Pierce,	2 00
For the third best, to J. H. Bell,	1 00
CRANBERRIES.—For the best half-peck, to A. T. Brown,	4 00
For the second best, to C. N. Brackett,	3 00
GREENFLESH MELONS.—For the best four specimens, to Walter Russell,	4 00
For the second best, to J. B. Moore,	3 00
For the third best, to George F. Stone,	2 00
MUSKMELONS.—For the best four specimens, to J. H. Bell,	4 00
For the second best, to S. A. Merrill,	3 00
WATERMELONS.—For the best pair, to J. J. H. Gregory,	4 00
For the second best, to Mrs. M. T. Goddard,	3 00
For the third best, to J. J. H. Gregory,	2 00
BEANS.—For the best two quarts of Large Lima, to B. G. Smith,	4 00
For the second best, to George Hill,	3 00
For the third best, to C. E. Grant,	2 00
PARSNIPS.—For the best twelve specimens, to J. L. DeWolf,	4 00
For the second best, to W. A. Crafts,	3 00
For the third best, to W. W. Rawson,	2 00
POTATOES.—For the best four varieties, to Mrs. M. T. Goddard,	5 00
For the second best, to John Cummings,	4 00
For the third best, to John Cummings,	3 00
For the best peck of Bresee's Prolific, to J. Cummings,	2 00
For the best Brownell's Beauty, to J. Cummings,	2 00
For the second best, to Walter Russell,	1 00
For the best Early Rose, to J. Cummings,	2 00
For the second best, to J. B. Moore,	1 00
For the best Jackson, to C. N. Brackett,	2 00
For the second best, to John Cummings,	1 00
For the best Snow Flake, to John Cummings,	2 00
For the second best, to John L. DeWolf,	1 00
For the best peck of any other variety, to J. Cummings, for Eureka,	2 00
For the second best, to Mrs. M. T. Goddard, for Hardy's Seedling,	1 00

SALSIFY.—For the best twelve specimens, to J. L. DeWolf,	$4 00
For the second best, to W. A. Crafts,	3 00
For the third best, to Walter Russell,	2 00
SQUASHES.—For the best four Canada, to Josiah Pratt,	4 00
For the second best, to George Dorr,	3 00
For the third best, to C. C. Calder,	2 00
For the best four Hubbard, to S. W. Hathaway,	4 00
For the second best, to J. J. H. Gregory,	3 00
For the third best, to Walter Russell,	2 00
For the best four Marrow, to S. W. Hathaway,	4 00
For the second best, to John Fillebrown,	3 00
For the third best, to George Hill,	2 00
For the best four Marblehead, to S. W. Hathaway,	4 00
For the second best, to J. J. H. Gregory,	3 00
For the third best, to John Cummings,	2 00
For the best four Turban, to S. W. Hathaway,	4 00
For the second best, to John Fillebrown,	3 00
For the third best, to J. J. H. Gregory,	2 00
TURNIPS.—For the best twelve specimens, to Anthony Hatch,	3 00
For the second best, to George Russell,	2 00
For the third best, to Walter Russell,	1 00
For the best twelve Swedish Turnips, to J. Comley,	3 00
For the second best, to Mrs. M. T. Goddard,	2 00
CABBAGES.—For the best four Drumhead, to Seth W. Hathaway,	4 00
For the second best, to John Cummings,	3 00
For the third best, to J. B. Tilley,	2 00
For the best Red, to J. Cummings,	4 00
For the second best, to Anthony Hatch,	3 00
For the third best, to Timothy Corey,	2 00
For the best three Savoy, to J. Cummings,	4 00
For the second best, to Walter Russell,	3 00
For the third best, to George Russell,	2 00
PEPPERS.—For the best twenty-four specimens, to G. F. Stone,	4 00
For the second best, to C. N. Brackett,	3 00
For the third best, to J. H. Bell,	2 00
ONIONS.—For the best peck, to John Cummings,	3 00

For the second best, to John B. Moore, . . .	$2 00
For the third best, to George Hill, ...	1 00
For the best three varieties, to John B. Moore, . .	5 00
For the second best, to Samuel Hartwell, . .	4 00
For the third best, to George Hill, ...	3 00
EGG PLANT.—For the best Black Pekin, to George W. Pierce, ...	4 00
For the second best, to Josiah Crosby, . . .	3 00
For the third best, to John Cummings, . . .	2 00
For the best Round Purple, to Walter Russell, . .	4 00
For the second best, to George Russell, . . .	3 00
For the third best, to George Hill, ...	2 00
ENDIVE.—For the best four specimens, to Walter Russell,	3 00
HORSERADISH.—For the best six roots, to John Fillebrown, ...	4 00
For the second best, to Walter Russell, . . .	3 00
For the the third best, to W. W. Rawson, . .	2 00

Gratuities:—

To L. P. Boothby, for Jay's Seedling Potato, . .	1 00
M. W. Chadbourne, for Squash, ...	1 00
Samuel Hartwell, for Parsley, ...	1 00
J. H. Bell, " "	1 00
Walter Russell, " "	1 00
John Cummings, for Pumpkins, ...	1 00
A. T. Brown, " "	1 00
Samuel Hartwell, for Watermelons, ...	1 00
J. H. Bell, for Melons, ...	1 00
J. J. H. Gregory, for collection of Potatoes, . .	3 00
Harry L. Rand, " " " Gourds, . .	3 00
W. P. Walker, " " " " . .	1 00
Louis Prang, " " " " . .	1 00
J. J. H. Gregory, " " " Tomatoes, . .	1 00
James Comley, " " " Turnips, . .	2 00
" " " "	5 00
G. M. Mellen, " "	1 00
D. R. Beckford, Jr., " "	1 00
John Fillebrown, " "	1 00

SEPTEMBER 29.

Gratuities: —

To C. E. Grant, for collection, ... $2 00
C. N. Brackett, for Sweet Corn, ... 1 00

OCTOBER 6.

CAULIFLOWERS.—For the best four specimens, to John B. Moore, ... 4 00
For the second best, to John Cummings, . . 3 00
For the third best, to M. W. Chadbourne, . . 2 00
CELERY.—For the best four roots, to Josiah Crosby, . 4 00
For the second best, to John Fillebrown, . . 3 00
CABBAGES.—For the best three Drumhead, to J. Cummings, ... 3 00
For the best Red, to J. Cummings, ... 3 00
For the best Savoy, to J. Cummings, ... 3 00
SALSIFY.—For the best twelve specimens, to Josiah Crosby, 3 00
HORSERADISH.—For the best six roots, to John Fillebrown, 3 00

Gratuities:—

To Samuel G. Stone, for Lima Beans and Corn, . . 2 00
Samuel Hartwell, for Lima Beans, ... 1 00
John Cummings, for collection of Squashes, . . 1 00
D. R. Beckford, Jr., for collection, ... 1 00
C. E. Grant, " " 1 00
C. N. Brackett, " " 1 00

OCTOBER 13.

Gratuity: —

To Samuel G. Stone, for collection, ... 1 00

NOVEMBER 3.

Gratuity:—

To Josiah Crosby, for Celery and Cauliflowers, . . 2 00

NOVEMBER 10.

CAULIFLOWERS. — For the best four specimens, to Josiah Crosby, ... 4 00
For the second best, to John Cummings, . . 3 00

CELERY.—For the best four roots, to Josiah Crosby, . $4 00
For the second best, to J. Fillebrown, . . . 3 00
CABBAGES.—For the best Red, three specimens, to John Cummings, ... 3 00
For the best Savoy, to J. Fillebrown, . . . 3 00
For the second best, to John Cummings, . . 2 00

Gratuity:—

To A. S. M'Intosh, for Artichokes, ... 1 00

DECEMBER 15.

Gratuity:—

To W. D. Philbrick, for Lettuce, ... 1 00

The amount awarded to each contributor is as follows:

Ames, R. W. . .	$2 00	Garfield, Charles .	$4 00
Anderson, Alexander	2 00	Gill, Mrs. E. M. .	3 00
Andrews, W. T. .	2 00	Goddard, Mrs. M. T.	18 00
Atkinson, C. M. .	15 00	Grant, C. E. . .	25 00
Bard, James . .	14 00	Gregory, J. J. H. .	24 00
Beckford, D. R., Jr. .	3 00	Hartwell, Samuel .	32 00
Bell, J. H. . . .	32 00	Hatch, Anthony .	6 00
Boothby, L. P. . .	1 00	Hathaway, S. W. .	20 00
Brackett, C. H. . .	15 00	Heustis, Warren .	2 00
Brackett, C. N. . .	37 00	Hill, George . .	51 00
Brown, A. T. . .	5 00	Horner, Mrs. C. N. S.	1 00
Calder, C. C. . .	2 00	Hovey & Co. . .	1 00
Chadbourne, M. W. .	20 00	Kingman, C. D. . .	7 00
Child, W. C. . .	8 00	Mellen, G. M. . .	3 00
Comley, James, . .	28 00	Merrill, S. A. . .	3 00
Corey, Timothy . .	2 00	M'Intosh, A. S. . .	2 00
Crafts, W. A. . .	6 00	Moore, J. B. . .	50 00
Crosby, Josiah . .	118 00	Partridge, H. . .	1 00
Cummings, J. . .	95 00	Philbrick, W. D. .	41 00
DeWolf, J. L. . .	9 00	Pierce, G. W. . .	9 00
Dickinson, Alexander .	3 00	Prang, Louis . .	1 00
Dorr, George . .	14 00	Pratt, Josiah . .	4 00
Duffley, Daniel . .	2 00	Prescott, W. G. . .	1 00
Eaton, Horace . .	2 00	Rand, Harry L. . .	2 00
Emery, Levi . .	1 00	Rawson, W. W. .	5 00
Fillebrown, John .	27 00	Russell, George . .	8 00

Russell, Walter	$121 00	Tailby, Joseph	$2 00
Slack, Lewis	1 00	Tilley, J. B.	2 00
Smith, Benj. G.	15 00	Walker, W. P.	1 00
Stone, G. F.	14 00	Weston, L. W.	7 00
Stone, S. G.	8 00	Wood, E. W.	1 00

Amount of Appropriation,		$1,000 00
Awarded in Prizes,	$728 00	
Awarded in Gratuities,	200 00	
Total amount of Awards,		928 00
Amount of Appropriation unexpended,		$72 00

REPORT

OF THE

COMMITTEE ON GARDENS,

FOR THE YEAR 1877.

BY JOSEPH H. WOODFORD, CHAIRMAN.

The Garden Committee received the following applications to visit places during the year, viz.:

One from Henry Youell, gardener at the City Hospital, of Boston, to inspect the flower garden connected with that institution.

One from Henry Ross, Superintendent of the Newton Cemetery, to inspect that Cemetery.

One from Francis B. Hayes, of Lexington, to inspect his estate, entered for the Hunnewell Triennial Prize.

One from John Falconer, gardener to Mrs. C. H. Leonard, to visit her flower garden, at Rochester.

At the first regular meeting of the Committee, it was voted to lay the application of Mr. Youell on the table, and to instruct the Chairman to privately visit the garden of the City Hospital, and if, in his judgment, he believed it to be worthy of an official inspection to notify the Committee. The Chairman did make the visit, but did not deem it advisable to call the Committee together for an official inspection, as there was nothing of special interest either in the plants or their arrangement, to call forth much praise. The heating apparatus for the greenhouse, described in the Garden Committee's Report for 1875, is worthy of a much better result than Mr. Youell seems to derive from it, judging from the display of plants on the hospital grounds, and that report, in the judgment of the Chairman would be a fair one for this year.

The application of Mr. Falconer to visit Mrs. C. H. Leonard's

flower garden, at Rochester, we are sorry to say, did not reach the Committee until after the date (August 1st), fixed by the Society, for receipt of applications, had passed; and the Committee voted reluctantly to abide by the rules, regretting that thereby they were depriving themselves of a pleasant day's duty, brought vividly to mind by the recollection of a visit to the hospitable mansion of Mrs. Leonard, in 1875. And in this connection the Committee would remind members and others that all applications must be in hand before August 1st, according to the rules.

Francis B. Hayes' Estate.

On the 8th of August, the Garden Committee, with a few invited guests, members of this Society and eminent for their good taste in horticultural affairs, visited the estate of Francis B. Hayes, at Lexington. This estate is entered for the Hunnewell Triennial Prize.

It consists of a farm of several hundred acres, nearly in the centre of which is situated a high eminence called Granny's Hill. Excavations on the top of this hill discovered a natural reservoir of water, which is conveyed in pipes to every portion of the farm.

Fifteen years ago the whole estate was a waste huckleberry pasture, uncultivated and unkept; but through the energy and indomitable perseverance of the proprietor, it now presents a wonderfully fertile and thrifty appearance.

The grounds about the mansion house were tastefully laid out and judiciously planted with choice trees and shrubs, and showed the effect of generous culture and good taste. The situations of the flower plats were judiciously chosen, and the beds were well filled with choice plants and flowers. Fruit and vegetable gardens were also located in the best manner, conveniently near the mansion, yet separated from it by the skilful arrangement of evergreens. The cultivation was thorough and clean; the vegetables and fruit generally were in good condition, and the management of the whole place was admirable, combining present comfort with future usefulness.

The recollections of the Revolution clustering around this place, make it worthy of all that the present owner is doing to improve and beautify it. Among the many interesting localities pointed out to the Committee, the most memorable is the knoll on which Samuel Adams and John Hancock halted as they retired from Lex-

ington on the morning of the 19th of April, 1775, when Adams, seeing that his country's independence was rapidly hastening on, exclaimed with the voice of a prophet, "Oh! what a glorious morning is this!" The Committee, as they stood upon this spot, and as they listened to the narration by their host of other interesting incidents, could not but desire that he should record the history of all that happened upon his estate, during that memorable time, and hand down to his posterity the remembrance that the soil they cultivate is sacred ground.

Future visits to this fine estate will be looked forward to with pleasure and a careful record will be kept by the incoming Committee.

Newton Cemetery.

On the 7th of September, your Committee paid an official visit to the Newton Cemetery, of which Henry Ross is superintendent.

They commend this cemetery to the inspection of all who like to see what can be done by judicious management toward beautifying nature. The natural advantages of this cemetery are probably not excelled by those of any other in this vicinity, but when these advantages are improved by the careful grouping of trees and shrubs, interspersed with plats of beautiful plants and flowers, it is difficult to express the satisfaction and pleasure experienced when viewing the results of such simple yet elegant taste, as is displayed in this cemetery. The Chairman of this Committee has visited this cemetery eight times during the past season, watching the progress of improvements as they were being developed; has looked over the plans for the future, and now takes great pleasure in commending this cemetery as a quiet and beautiful resting place for the body after the spirit has gone back to God who gave it. One of the plans in its management is to discountenance cumbrous granite curbings, thereby causing the grounds to present the aspect of a well kept landscape garden, without that heavy appearance where great quantities of granite are used. Another, and perhaps the best, regulation is that whenever a lot is sold an additional sum of money is required, the interest of which is used in the perpetual care of the lot, which precaution insures the grounds being always kept in the best possible condition. It is a pleasant thought while one is yet alive that his last bed will be continually and forever strewn with beautiful flowers, the smiles of an ever present God.

During the past summer the greenhouses connected with the cemetery have been very much enlarged, thereby enabling the superintendent to grow a greater quantity of plants to beautify the new lots added, the number of which increases year by year.

We award the superintendent, Mr. Henry Ross, a gratuity of $25 for correct taste displayed in planting flower-beds and beautifying the grounds.

For the Committee,

JOSEPH H. WOODFORD, *Chairman.*

REPORT

OF THE

COMMITTEE ON PUBLICATION AND DISCUSSION.

In accordance with the purpose expressed in our last report, your Committee obtained as lecturers during the past season, Professor George L. Goodale, of Harvard University; Professor Levi Stockbridge, of the Massachusetts Agricultural College; B. Pickman Mann, of Cambridge; and Byron D. Halsted, of the Bussey Institution. Their lectures were received with general interest, and led to discussions which were continued from week to week. We think it is evident that these researches of scientific investigators will be both interesting and serviceable to our members, and also, that there will be mutual advantage from this close comparison of theory and experience. Accordingly, your Committee purpose in the coming season to intersperse lectures, prize essays, and discussions, as has been done during the year past.

From the manuscripts submitted to the examination of the Committee, the following have been selected for prizes or gratuities:

For the best Essay upon the Ripening and Marketing of Pears, to J. W. Pierce, the prize of . . .	$25 00
For the best Essay upon Bottom Heat, its Benefits and Methods, to W. D. Philbrick, the prize of . .	25 00
For an Essay upon the Culture and Varieties of Roses, to William H. White, a gratuity of	10 00
For an Essay upon Garden Irrigation, its Advantages and Limits, to W. D. Philbrick, a gratuity of . .	10 00

For the Committee,

WILLIAM C. STRONG, *Chairman.*

REPORT OF THE SECRETARY.

I have the satisfaction to announce the completion, as far as the close of the year 1874, which was the period aimed at, of the history of the Society. The chapters have, as completed from time to time, been submitted to the examination of the President of the Society. Besides this work, and keeping the records of the Society and of the Executive Committee—the work coming under the head of editorial, including making notes of our discussions, writing out and submitting them to the various speakers for revision, the preparation of other matter contained in our Transactions and Schedules for the press, and superintending its printing, together with the reports of the weekly and annual exhibitions, all of which may be classed as among the routine duties of the Secretary—the correction of the lists of Honorary and Corresponding Members, which stood in great need of revision, has engaged my attention. These lists contained 345 names, of which 158 were unstarred, and of the latter there were 75 members, some of them among the first chosen at the organization of the Society in 1829, from whom nothing had been heard for many years, and of whom we did not even know whether or not they were still living. It was believed that a large part of this number must have deceased, and diligent correspondence has resulted in ascertaining that such was the case with more than half the number, whose names will appear in our next publication with the prefix of "the inevitable star," and in making many other corrections. I would here return thanks in behalf of the Society, to all who have so courteously and freely given their assistance in revising these lists, and would ask all correspondents of the Society, and any others into whose hands our publications may fall, to communicate such information as to the decease or change of residence of Honorary or Corresponding Members, or on other points, as will aid in the further correction of the lists.

Besides the subjects above mentioned, there have been the usual miscellaneous calls for information on different subjects, which, as might be expected, increase rather than diminish in number from year to year, all of which have been answered to the best of my ability.

ROBERT MANNING, *Secretary.*

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS,

FOR THE YEAR 1877.

The Committee of Arrangements of the Massachusetts Horticultural Society would respectfully submit the following report:

Meetings of the Committee have been held at stated times during the year to consider their duties in connection with the Rose and Strawberry Shows in June, and the Annual Exhibition of the Society in September. At one of the meetings called in the early part of the season, Sub-Committees consisting of members of the Flower, Fruit, and Vegetable Committees were appointed for the purpose of having the tables properly arranged for the reception of Plants, Flowers, Fruits, and Vegetables from the growers; a duty which has been performed to the satisfaction of all parties, if we may judge from the expressions of approval from exhibitors and others.

To make a report of the entries of Fruits, Flowers, and Vegetables contributed to the several exhibitions would seem to be one of the duties of this Committee, but as this work has been fully and faithfully accomplished by the Chairmen of the several Committees, it would only be a useless repetition for the Committee of Arrangements to undertake to perform what has already been so well done. A full report of the action of the Committee would fail to be of very much interest, consisting as it does of much detail work, such as the arranging of the halls, seeing that proper places are assigned to the exhibitors, looking after the advertising and the printing of tickets, and seeing that the exhibitions are fully noticed and reported by the newspapers, which the Committee have done during the year 1877, as at all times in the past, to the best of their ability. No pains have been spared by the Committee to make the exhibitions a success, and a credit to the Society and to sustain its high standing in the community.

CHAS. H. B. BRECK, *Chairman.*

REPORT

OF THE

LIBRARY COMMITTEE.

The library has this year been largely increased by the purchase of many valuable books. The shelves are very much crowded, and it is hoped that during the next year additional accommodations will be provided.

The appropriation of the Society has been wholly expended for periodicals and binding, and the income of the Stickney Fund has been used, according to the terms of the loan, in the purchase of books exclusively.

Your Committee regret that it has been found necessary to cut down the appropriation by the Society for the coming year, but hope that during the year it will be increased to the usual amount.

A list of the books and magazines purchased and presented accompanies this report.

For the Committee,

WALDO O. ROSS, *Chairman.*

LIBRARY ACCESSIONS IN 1877.

Books Purchased.

Pritzel, G. A. Thesaurus Literaturæ Botanicæ Omnium Gentium. New edition, 4to. Leipsic: 1872.

Buek, H. W. Genera, Species, et Synonyma Candolleana, or Index to De Candolle's Prodromus. 4 vols. in 3. 8vo. Berlin: 1842–1874.

Hobbs, Charles E. Botanical Hand-Book, etc. Large 8vo. Boston: 1876.

Henslow, Rev. J. S. A Dictionary of Botanical Terms. New edition. 12mo., 190 wood cuts. London: no date.

Walpers, G. G. Annales Botanices Systematicæ. 7 vols. 8vo. Leipsic: 1848–1868.

Kunth, C. S. Enumeratio Plantarum, etc. 5 vols., 8vo., and 1 vol. of Supplement with 40 plates. Stutgard and Tubingen: 1833–1850.

Sertum Botanicum. Collection de Plantes remarquables par leur Utilité, leur Élégance, leur Éclat, on leur Nouveauté. Par une Société de Botanistes. 7 vols. Folio, 600 colored plates. Brussels: 1828.

Edwards, John. The British Herbal, etc. Folio, 100 colored plates. London: 1770.

Hooker, Sir William J. Filices Exoticæ; or Colored Figures and Descriptions of Exotic Ferns. 4to., 100 colored plates. London: 1859.

——— — —. British Jungermanniæ. Folio. 82 colored plates. London: 1816.

De Candolle, A. P. Astragalogia nempe Astragali, Biserrulae et Oxytropidis nec non Phacae, Colutae et Lessertiae Historia. Royal 4to. 50 plates. Paris: 1802.

Jacquin, Nicolaus Josephus. Oxalis Monographia. 4to. 81 pl., mostly colored. Vienna: 1794.

Miquél, F. A. Guil. Monographia Generis Melocacti. 4to. 11 plates, partly colored. Breslau and Bonn: 1840.

Baillon, M. H. Etude Générales du Groupe des Euphorbiacées. With atlas of 27 plates. Large 8vo. Paris: 1858.

Bateman, James. Monograph of Odontoglossum. Part VI., to complete duplicate set.

Allnutt, H. The Cactus and other Tropical Succulents. 16mo. 57 wood-cuts. London: 1877.

Darwin, Charles. The Effects of Cross and Self-Fertilization in the Vegetable Kingdom. 8vo. London: 1876.

——— ——. The Various Contrivances by which Orchids are Fertilized by Insects. 2d edition, 8vo., 38 wood-cuts. London: 1877.

——— ——. The Different Forms of Flowers in Plants of the same Species, with illustrations. 8vo. London: 1877.

Gray, Asa. Darwiniana; Essays and Reviews pertaining to Darwinism. 12mo. New York: 1877.

Barton, William P. C., M. D. Vegetable Materia Medica of the United States. 2 vols. 4to., 50 colored plates. Philadelphia: 1817, 1818.

Barton, Benjamin H., F. L. S., and Thomas Castle, M. D., F. L. S. The British Flora Medica. New edition, by John R. Jackson, A. L. S. 8vo. 48 colored plates. London: 1877.

Bentley, Robert, and Henry Trimen. Medicinal Plants. Parts 16–18, in continuation. 8vo., colored plates. London: 1877.

Reichenbach, H. G. L. Iconographia Botanica seu Plantæ Criticæ. etc. 10 vols., 4to., 1000 colored plates. Leipsic: 1823–1832.

Botanische Zeitung. 35 vols., small 4to. With plates. Berlin; 1843–72, 1873–76. Still publishing.

Seemann, Wilhelm E. G., and Berthold. Bonplandia. Zeitschrift für die gesammte Botanik. 10 vols. Imperial 8vo. Hannover: 1853–62.

Revue des Eaux et Forêts, etc. 15 vols. 8vo. Paris and Brussels, 1862–1876. Still publishing.

Répertoire de Législation et de Jurisprudence Forestières. 6 vols. 8vo. Paris: 1863–1875. Still publishing.

Brown, John Croumbie, LL. D. Reboisement in France; or Records of the Replanting of the Alps, the Cevennes, and the Pyrenees with Trees, Herbage, and Bush. 8vo. London: 1876.

Cooper, Ellwood. Forest Culture and Eucalyptus Trees. 12mo. San Francisco: 1876.

Bentham, Georgius. Plantæ Hartwegianæ. 8vo. London: 1839–1857.

Harvey, W. H., M. D., F. R. S., etc. Thesaurus Capensis; or Illustrations of the Plants of South Africa. 2 vols. 8vo. 200 plates. Dublin, London, and Cape Town: 1859, 1863.

——— — —. The Genera of South African Plants. 2d edition. Edited by J. D. Hooker, M. D., etc. Cape Town and London: 1868.

Munby, G. Flore de l'Algérie. 8vo. pamphlet. 7 plates. Paris: 1847.

Harcus, William. South Australia; its History, Resources and Productions. 8vo. Many wood-cuts. London: 1876.

Williams, B. S., F. R. H. S. The Orchid Growers' Manual. 5th edition. 12mo., with numerous illustrations. London: 1877.

Heath, Francis George. The Fern World. 8vo. Colored and other plates. London: 1877.

Roe, Rev. E. P. Play and Profit in my Garden. 8vo. New York: no date.

Burbidge, F. W. Cultivated Plants, their Propagation and Improvement. 8vo. Edinburgh and London: 1877.

Bossin, M. Les Plantes Bulbeuses. 2 vols. in one. 12mo. Paris: 1872.

Brill, Francis. Farm-Gardening and Seed-Growing. 12mo. New York: no date [1872?].

Buel, Jesse. The Farmer's Companion, etc. 12mo. Boston: 1840.

Child, David Lee. The Culture of the Beet and Manufacture of Beet Sugar. 12mo. Boston: 1840.

Eley, Henry, M. A. Geology in the Garden. 32mo. London: 1859.

Sprengel, Christian Konrad. Das Entdeckte Geheimniss der Natur im Bau und in der Befruchtung der Blumen. Small 4to. 25 copper plates. Berlin: 1793.

Packard, A. S. Jr. Half Hours with Insects. Parts 5—12, to complete the work. 8vo. Boston: 1877.

Books and Pamphlets Presented.

Burmannus, Joannis. Rariorum Africanarum Plantarum. 4to., 100 plates. Amsterdam: 1738. E. S. Rand, Jr.

Wight, Robert. Contributions to the Botany of India. 8vo. London: 1834. E. S. Rand, Jr.

——— —— and G. A. Walker-Arnott. Prodromus Floræ Peninsulæ Indiæ Orientalis. Vol. 1. 8vo. London: 1834. E. S. Rand, Jr.

Porter, T. C., and J. M. Coulter. Synopsis of the Flora of Colorado. 8vo. Washington: 1874. Henry Gannett.

Mueller, F. Vegetation of Chatham Islands. Royal 8vo. 7 plates. Melbourne: 1864. E. S. Rand, Jr.

Grisebach, A. Plantæ Wrightianæ e Cuba Orientalis. Parts I and II. From the Memoirs of the American Academy of Arts and Sciences, New Series, vol. 8. 2 pamphets, 4to. Cambridge: 1860, 1862. Prof. Asa Gray.

Mann, B. Pickman. Catalogue of the Phænogamous Plants of the United States, East of the Mississippi, and of the Vascular Cryptogamous Plants of North America, North of Mexico. 2d edition. 8vo. pamphlet. Cambridge: 1872. The Author.

Reid, G. H. An Essay on New South Wales. 8vo. pamphlet; map and plates. Sidney: 1876. John Wiley & Sons.

Jussieu, Adrian de. Cours Élémentaire d' Histoire Naturelle Botanique. 12mo. Paris: 1840. E. S. Rand, Jr.

Miquel, F. A. G. Cycadearum Monographia. Folio. 8 plates. Trajecti ad Rhenum: 1842. Prof. Asa Gray.

Lindley, Prof. John. Folia Orchidacea, an enumeration of the known species of Orchids. Parts I–VIII. 8vo. London: 1852—59. Prof. Asa Gray.

McNab, James. On the Re-Tubbing of Palms and other large Exotics. Results obtained from the Cutting and Transplanting of a Plaited Horn-Beam Hedge. On the discoveries of Mr. John Jeffrey and Mr. Robert Brown in a Botanical Expedition to British Columbia, with remarks on the cultivation of certain species. On the Effects of Pruning certain Coniferous Trees and Shrubs. 4 pamphlets, 8vo. Edinburgh: 1856, 1870, 1872. Waldo O. Ross.

Morren, Édouard. La Digestion Végétale. 8vo. pamphlet. Brussels: 1876. E. S. Rand, Jr.

Meehan, Thomas. Mr. Darwin on the Fertilization of Flowers. 8vo. pamphlet. Philadelphia: 1877. The Author.

Boardman, S. L. Some Notes on the History, Varieties, and Statistics of Indian Corn. 8vo. pamphlet. Augusta: 1877. The Author.

Oliver, Daniel, F. R. S., F. L. S. Guide to the Royal Botanic Gardens and Pleasure Grounds at Kew. Small 8vo. pamphlet; 56 wood-cuts. London: 1872. W. O. Ross.

Morren, Édouard. Correspondance Botanique. Liste des Jardins, des Chairs, et des Musées Botaniques du Monde. 5th edition; 8vo. pamphlet. Liege: 1877. The Author.

The Naturalist's Directory, containing the names of Naturalists, Chemists, Physicians, and Meteorologists. 8vo. pamphlet. Salem: 1877. Naturalist's Agency.

Annual Register of Rural Affairs, for 1878. L. Tucker & Son.

Sturtevant, E. Lewis and Joseph N. The North American Ayrshire Register. 8vo., 2 vols. in 1. South Framingham: 1875, 1877. E. L. Sturtevant.

Pleasonton, Gen. A. J. The Influence of the Blue Ray of the Sunlight, and of the Blue Color of the Sky in developing Animal and Vegetable Life, etc. 8vo. Philadelphia: 1876. Exchange.

Gregory, J. J. H. Onion Raising; what kinds to raise, and the way to raise them. Cabbages; how to grow them. Carrots, Mangolds, and Sugar Beets; how to raise, keep, and feed them. Squashes; how to grow them. 4 pamphlets. The Author.

New England Farmer. 4to., 13 numbers to fill gaps in the set. Essex Institute.

Bulletin de la Federation des Sociétés d'Horticulture de Belgique; 8vo. pamphlet. Liége: 1875. Édouard Morren, Secretary.

Bulletin de la Société Centrale d'Horticulture du Département de la Seine-Inferieure. Tome 18, Part 3. 8vo. pamphlet. Rouen: 1876.

Charter, Constitution, and By-Laws of the New York Horticultural Society. Schedule of Premiums offered by the same Society; 2 pamphlets. New York: 1877. James G. Murkland, Corresponding Secretary.

Proceedings of the Western New York Horticultural Society at their Twenty-seventh Annual Meeting, February, 1877. 8vo. pamphlet. P. Barry, President.

Proceedings of the New Jersey State Horticultural Society, January 1876. 8vo. pamphlet. B. B. Hance, Corresponding Secretary. The same for 1877. E. Williams, Secretary.

Proceedings of the Georgia State Horticultural Society at its first session, Macon, August, 1876. 8vo. pamphlet. Augusta: 1877. J. S. Newman, Secretary.

Tenth Annual Report of the Ohio State Horticultural Society for 1876–7. 8vo. pamphlet. M. B. Bateham, Secretary.

Transactions of the Indiana Horticultural Society, for 1871, 1872, 1874, 1875, 1876. 7 vols. 8vo. Indianapolis: 1871—1877. D. E. Hoffman.

Transactions of the Illinois Horticultural Society for the years 1875 and 1876. New series, vols. 9 and 10; 8vo. Chicago: 1876, 1877. O. L. Barler, Secretary.

Annual Report of the Iowa Horticultural Society for 1873, etc.; 8vo. Des Moines: 1874. W. C. Flagg. The same for 1876. G. B. Brackett, Secretary.

Transactions of the Wisconsin State Horticultural Society for 1871—74, and 1877. 5 vols. 8vo. F. W. Case.

Reports of the Kansas State Horticultural Society, 1871—1876. 6 vols., 8vo. Topeka: 1872—1877. G. C. Brackett, Secretary.

Transactions of the Worcester County Horticultural Society for 1876, with Schedule of Prizes for 1877. 8vo. pamphlet. Worcester: 1877. J. C. Newton, Librarian. Another copy from E. W. Lincoln, Secretary.

Transactions of the Marshfield Agricultural and Horticultural Society for 1876. 8vo. pamphlet. Plymouth: 1877. George M. Baker, President.

Wilder, Marshall P. Address delivered at the sixteenth session of the American Pomological Society, at Baltimore, September 12, 1877. 8vo. pamphlet. Boston: 1877. The Author.

Fourth Annual Report of the Maine State Pomological Society for 1876. G. B. Sawyer, Secretary.

Report of the Pennsylvania Fruit Growers' Society for the year 1876. 8vo. pamphlet. Harrisburg: 1876. E. B. Engle, Secretary.

Reports of the Michigan State Pomological Society, 1872—5. 4 vols., 8vo. Lansing: 1873—1876. R. G. Baird. The same for 1876. 1 vol., 8vo. Lansing: 1877. C. W. Garfield, Secretary.

Transactions and Second Report of the Fruit Committee of the Montreal Agricultural and Horticultural Society for 1876. Henry S. Evans, Secretary.

Report of the Fruit Growers' Association of the Province of Ontario for 1876. 8vo. pamphlet. D. W. Beadle, Secretary.

Second Annual Report of the Board of Commissioners of the Department of Public Parks of New York, for the year ending May, 1872. Also, Third General Report, from May 1, 1872, to December 31, 1873. Large 8vo. pamphlet; many maps, charts, and plates. Hon. A. H. Green, Commissioner.

Report of the South Park Commissioners to the Board of County Commissioners of Cook County, Illinois, for 1876. 8vo. pamphlet. Chicago: 1877. Two copies. H. W. Harmon, Secretary.

Tenth and Seventeenth Annual Reports of the Public Park Commission of Baltimore for 1869 and 1876. Two pamphlets, 8vo. Baltimore: 1870, 1877. D. Rayhies, Secretary.

Reports of the United States Department of Agriculture for 1875 and 1876. 2 vols., 8vo. The Commissioner.

Report of the United States Commissioner of Patents for the year 1851. Part II., Agricultural. 8vo. Washington: 1852. Essex Institute.

Twenty-first Annual Report of the Secretary of the Maine Board of Agriculture for the year 1876. 8vo. Augusta: 1876. Two copies. S. L. Boardman, Secretary.

Third Report of the Vermont State Board of Agriculture for the years 1875 and 1876. 8vo. Rutland: 1876. H. M. Seely, Secretary.

Twenty-fourth Report of the Secretary of the Massachusetts Board of Agriculture for 1876. 8vo. Boston: 1877. C. L. Flint, Secretary.

Colman, Henry. First, Second, and Third Reports on the Agriculture of Massachusetts, by Henry Colman, Commissioner. 3 pamphlets, 8vo. Boston: 1838—40, to complete the work. Essex Institute.

Tenth Annual Report of the Secretary of the Connecticut Board of Agriculture, 1876–7. 8vo. Hartford: 1877. T. S. Gold, Secretary.

Twenty-fifth Annual Report of the Indiana State Board of Agriculture, Vol. XVII., 1875. 8vo. Indianapolis: 1876. Alexander Heron, Secretary.

Transactions of the Department of Agriculture of Illinois for the year 1875. Vol. V., New Series. 8vo. Springfield: 1876. S. D. Fisher, Secretary.

Transactions of the Michigan State Board of Agriculture, 1872—76. 4 vols., 8vo. Lansing, 1873—6. R. G. Baird, Secretary. Also, extra copies for distribution.

Monthly Reports of the Kansas State Board of Agriculture for February, March, August, September, and October. 8vo. pamphlets. Topeka: 1877. Alfred Gray, Secretary.

Annual Reports of the Commissioner of Agriculture and Arts for the Province of Ontario, for 1874 and 1875. Two thick 8vo. pamphlets. Toronto, 1875, 1876. Thomas P. James.

Transactions of the Michigan Agricultural Society for 1849—59. 11 vols. 8vo. Lansing, 1850—61. Prof. W. J. Beal.

Transactions of the Wisconsin State Agricultural Society, 1873–4, 1874–5, 1876–7. 3 vols. 8vo. Madison, 1874—7. F. W. Case, Secretary.

Transactions of the Middlesex Agricultural Society, for the year 1876. 8vo. pamphlet. Boston: 1877. B. W. Brown, Secretary.

Transactions of the Essex Agricultural Society for 1876. 8vo. pamphlet. Salem: 1876. C. P. Preston, Secretary.

Bulletin of the Bussey Institution, Vol. II., Part 2; Vol. III., Part 1. 2 pamphlets, 8vo. Boston: 1877. Librarian of the Bussey Institution.

Transactions of the Imperial Botanic Garden of St. Petersburg. Vol. I., Part 2, 1872; Vol. II., Parts 1 and 2, 1873; Vol. III., Parts 1 and 2, 1874. 5 pamphlets, 8vo. C. S. Sargent.

Seventh Annual Report of the Geological Survey of Indiana, made during the year 1875, by E. T. Cox, State Geologist. 8vo. Maps and plate. Indianapolis: 1876. D. E. Hoffman.

Riley, Charles V. Potato Pests; being an illustrated account of the Colorado Potato Beetle, etc. 12mo., 49 wood-cuts. New York. No date [1876?]. Dr. George Thurber.

Packard, A. S. Report on the Rocky Mountain Locust and other Insects. 8vo. pamphlet. Plates, wood-cuts, and maps. Washington: 1877. Department of the Interior.

Department of the Interior. Bulletin of the United States Entomological Commission, Nos. 1 and 2. 8vo. pamphlets. Washington: 1877. The Commission.

Phylloxera. 4 French pamphlets, 4to. Paris: 1874—7. Prof. Asa Gray.

Mann, B. Pickman. The White Coffee-Leaf Miner. Reprinted from the American Naturalist. The Author. Also, from the same, four articles reprinted from the Proceedings of the Boston Society of Natural History.

Catalogue of the Hampton Normal and Agricultural Institute, for the year 1875–6, with maps showing the situation of schools taught by graduates. S. C. Armstrong, Principal.

Report of the Curators of the University of Missouri, etc., for 1876. 8vo. pamphlet. Prof. G. C. Swallow.

Report of the United States Commissioner of Education, for the year 1875. 8vo. Washington: 1876. The Bureau of Education.

Twelfth Annual Catalogue of the Officers and Students of the Massachusetts Institute of Technology, 1876–7. 8vo. pamphlet. Boston: 1876. The Institute.

Annual Report of the Mercantile Library Association of San Francisco, for 1876. 8vo. pamphlet. San Francisco: 1877. A. E. Whitaker, Librarian.

Proceedings of the Boston Society of Natural History. Vol. XVIII, Parts 3 and 4. 2 pamphlets, 8vo. Boston: 1876, 1877. Memoirs of the Boston Society of Natural History, Vol. II. Part 4, Nos. 5 and 6. 2 pamphlets, 4to. Boston: 1877. The Society.

Proceedings of the American Antiquarian Society. Nos. 67, 68, 69. 3 pamphlets, 8vo. Worcester: 1876, 1877. The Society.

Wilder, Marshall P. Address at the Annual Meeting of the New England Historic, Genealogical Society, January 3, 1877. 8vo. pamphlet. Boston: 1877. The Author.

Periodicals Taken.

English. — Gardener's Chronicle.
" Magazine.
Journal of Horticulture and Cottage Gardener.
The Garden.
Curtis' Botanical Magazine.
Floral Magazine.
Florist and Pomologist.
Floral World.
Journal of the Linnean Society.
Journal of Botany.
Farmer's Magazine.
Country Gentleman's Magazine.
Journal of the Royal Agricultural Society.
Journal of Forestry.

French. — Revue Horticole.
Revue des Eaus et Forêts.

Belgian. — Illustration Horticole.
Flore des Serres.
Belgique Horticole.

German. — Botanische Zeitung.

AMERICAN.—Country Gentleman.
American Farmer.
Silliman's Journal.
American Naturalist.

PERIODICALS PRESENTED.

New England Farmer.
Massachusetts Ploughman.
American Cultivator,
Scientific Farmer.
American Agriculturist.
Gardener's Monthly.
American Rural Home.
Maine Farmer.
Prairie Farmer.
Maryland Farmer.
Semi-Tropical.
Western Agriculturist.
Center Union Agriculturist.
Bulletin of the Essex Institute.
Bulletin of the Torrey Botanical Club.
Botanical Gazette.
Patent Right Gazette.
New York Semi-Weekly Tribune.
Rhode Island Press.
Boston Evening Transcript.
Boston Daily Globe.
Daily Evening Traveller.
Boston Morning Journal.
The Nursery.
The Cottage Hearth.

TREASURER'S REPORT,

FOR THE YEAR 1877.

ITEMS OF INCOME.

Balance of Cash on hand,	$229 89
Received of William Gray, Jr., to pay prizes for 1876,	140 00
" from Rent of Stores,	9,140 39
" " " Halls,	11,276 81
" " Admissions and Assessments,	720 00
Gross Receipts of Annual Exhibition,	373 75
Interest on Bonds, C., B. & Q. R. R.,	105 00
Discount at Market Bank,	11,634 00
Received from Mount Auburn Cemetery,	1,157 42
	$34,776 76

ITEMS OF EXPENDITURE.

Salaries,	$4,600 00	
Library Accessions,	1,587 41	
Heating and Water, less paid by tenants,	333 04	
Stationery, Postage, and Printing,	1,358 53	
Alterations and Repairs on Building,	408 55	
Gas,	1,557 14	
Furniture, Fixtures, and Repairs,	229 37	
Taxes,	3,340 50	
Testimonial to E. S. Rand, Jr.,	100 00	
Expenses of Annual Exhibition,	367 26	
Entertainment of Committee of Arrangements,	300 00	
Lectures,	75 00	
Paid Cash borrowed on call,	11,000 00	
Interest,	3,716 51	
Labor and Incidental Expenses,	301 68	
Balance of Prizes for 1876,	575 84	
Deposited to pay Prizes of 1877,	4,000 00	
Balance carried to new account,	425 93	
		$34,776 76

Boston, January 18, 1878.

We have examined the foregoing account and found it correct, and the balance of cash on hand, four hundred and twenty-five dollars and ninety-three cents, as stated.

C. O. Whitmore, } *Finance*
H. H. Hunnewell, } *Committee.*

ASSETS AND LIABILITIES.

Assets.

Real Estate, Furniture, and Exhibition Ware, costing		$256,585 56
Library, last year,	$15,561 40	
Added this year,	1,587 41	
		17,148 81
Bonds of C., B. & Q. R. R. par value,		1,500 00
Total,		$275,234 37

Liabilities.

Mortgage debt at 5½ per cent., payable September, 1883,	$60,000 00	
Loan without interest, payable to Harvard College in 1899,	12,000 00	
Note to Market National Bank,	12,000 00	
		$84,000 00
Balance of assets over liabilities,		$191,234 37

By last year's report our members numbered . . .				1,008
Of these were Life Members,		587		
Added by election, . .	2			
Added by commutation, .	1			
	—	3		
		590		
Deceased, ...	8			
Resigned, ...	1	9		
			581	
Annual members,		421		
Added by payment, . .	6			
Added by remission of fee, .	1	7		
		428		
Commuted, . . .	1			
Deceased, ...	8			
Withdrawn, . . .	5			
Discontinued for non-payment of dues, ...	42			
	—	56		
			372	
			—	953
Income from the above:				
2 Life, ...		$60 00		
6 Annual, . . .		60 00		
300 Subscriptions, . . .		600 00		
		$720 00		

In review of the foregoing, you will note a decrease in income from the stores of over three thousand dollars, and a gratifying increase in that from the halls. Mount Auburn has yielded a small return over the deficit of last year. The receipts from admissions and assessments have been unusually small and call for inquiry as to the cause. Doubtless the general depression of business has much to do with it, but has not the *opening of our prizes to all* much more? It was hoped that this liberal course would bring to us a fair addition to our membership, but, mark the result—fewer additions than for many years past, and a larger number discontinued

for non-payment than ever before in my experience. I invite attention to this subject; I might enlarge upon the avidity with which these outsiders claim their awards and other privileges, but I forbear. Gas, repairs, incidentals, labor, etc., are, of course, proportioned to the use of the halls.

I would gladly make a more cheerful report, but am happy to say that while individuals all around us are failing in business, and corporations are crippled, we have added but one thousand dollars to our liabilities and have a corresponding increase in our assets.

Respectfully submitted,

E. W. BUSWELL, *Treasurer.*

JANUARY 19th, 1878.

Dr. *Massachusetts Horticultural Society, in account with the Proprietors of the Cemetery of Mt. Auburn.* **Cr.**

For Sales and Improvements within the Cemetery for the year ending Dec. 31, 1877.

Cost of filling up and improving land at Mt. Auburn, and expenditure on account of new Receiving Tomb, for the year ending Dec. 31, 1877; the Massachusetts Horticultural Society being charged with their proportion of the same.			By Sales in January,		
New Receiving Tomb,	$1,859 10		" " " February,	25 00	
Grading Stone Farm,	2,023 63		" " " March,	775 00	
" Fountain Avenue,	454 50		" " " April,	2,400 00	
" Vinca Path,	125 80		" " " May,	3,331 75	
" Halcyon Lake and Avenue,	346 56		" " " June,	2,542 00	
" Dell Path,	234 94		" " " July,	1,747 00	
" Oak and Willow Avenues,	331 12		" " " August,	2,071 50	
			" " " September,	2,749 00	
One-quarter of	$5,375 65	$1,343 91	" " " October,	2,901 00	
Balance due in settlement of account, for the year 1876,		2,590 31	" " " November,	1,172 00	
Interest on $2,590.31 one year,		155 42	" " " December,	2,028 00	
Balance due Massachusetts Horticultural Society,		1,157 42	" Net amount of receipts from Receiving Tomb,	249 00	
				$22,591 25	
			Less paid for Lot No. 4,449 repurchased,	203 00	
				$22,388 25	
			Deduct for Annual Expenses,	1,400 00	
			Mass. Horticultural Society, one-fourth part, of	$20,988 25	$5,247 06
		$5,247 06			$5,247 06

E. & O. E.

H. B. MACKINTOSH, *Treasurer.*

BOSTON, December 31, 1877.

MOUNT AUBURN CEMETERY CORPORATION,

Office, No. 16 Pemberton Square.

BOSTON, January 1, 1878.

To the Finance Committee of the Mass. Hort. Society:

GENTLEMEN,—Herewith please find account for the year 1877, showing a balance to the *credit* of the Massachusetts Horticultural Society of $1,157.42.

Very respectfully, your obedient servant,

H. B. MACKINTOSH, *Treasurer.*

MASSACHUSETTS HORTICULTURAL SOCIETY,

To the Proprietors of the Cemetery of Mount Auburn, *Dr.*

For one-fourth (¼) part of the following expenditures for grading lands and building New Receiving Tomb, during 1877:

New Receiving Tomb.		
J. W. Grigg's bill of tiles for floor,	$600 00	
" " " " panels for vestibule,	134 25	
M. C. Warren, " " sheet lead, 523 lbs.,	47 21	
A. J. Wilkinson, bill of six lbs. of copper wire,	2 70	
City of Cambridge, bill of 6¼ perch blue stone,	4 69	
J. H. Reed & Co., bill of iron,	51 68	
75 tons block stone,	187 50	
1450 ft. sods,	32 62	
Spikes and paint,	8 30	
10 bbls. cement,	12 00	
2684 ft. 3 in. hard pine plank,	101 99	
Planing the above,	13 42	
20 ft. planed pine plank,	90	
57½ ft. moulding,	1 15	
142½ days, masons,	391 19	
91 " common labor,	159 25	
4½ " painter,	9 00	
33¾ " man and horse,	101 25	
		$1,859 10
Stone Farm.		
435½ days, men,	762 13	
420½ " men and horses,	1,261 50	
		2,023 63
Fountain Avenue.		
156 days, men,	273 00	
60½ " men and horses,	181 50	
		454 50
Amount carried forward,		$4,337 23

Amount brought forward,		$4,337 23
Vinca Path.		
36¾ days, men,	64 80	
20½ " men and horses,	61 50	
		125 80
Halcyon Lake and Avenue.		
43¾ days, men,	76 56	
90 " men and horses,	270 00	
		346 56
Dell Path.		
80¼ days, men,	140 44	
31½ " men and horses,	94 50	
		234 94
Oak and Willow Avenues.		
154½ days, men,	270 37	
20¾ " men and horses,	60 75	
		331 12
Total amount 1877,		$5,375 65
One-fourth part is,		$1,343 91

MOUNT AUBURN, Dec. 31, 1877. J. W. LOVERING, *Supt.*

I certify the foregoing to be of a true copy of accounts of improvements for the year 1877, rendered by the Superintendent.

H. B. MACKINTOSH, *Treasurer.*

Massachusetts Horticultural Society.

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Secretary.

ROBERT MANNING, of Salem.*

Recording Secretary.

ROBERT MANNING, of Salem.

Professor of Botany and Vegetable Physiology.

JOHN ROBINSON, of Salem.

Professor of Entomology.

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*The Secretary may be addressed at Horticultural Hall, Boston.

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THE PROFESSOR OF ENTOMOLOGY.

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A * denotes the member deceased.

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*L'Abbé Berlèse, Paris.
*Nicholas Biddle, Philadelphia.
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*Mrs. Bigelow, Medford.
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*William Shaw, New York.

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*Jeremiah Wilkinson, Cumberland, R. I.
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*Frederick Wolcott, Litchfield, Conn.
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*Ashton Yates, Liverpool.

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A * denotes the member deceased.

*John Adlum, Georgetown, D. C.
Mons. Alfroy, Lieusaint, France.
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*Thomas Aspinwall, Brookline.
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*Eugène Achille Baumann, Bolwiller, France.
Joseph Bernard Baumann, Bolwiller, France.
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*NATHANIEL FELLOWS, Cuba.
*HENRY J. FINN, Newport, R. I.
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*MICHAEL FLOY, late Vice-President of the New York Horticultural Society, New York City.
*JOHN FOX, Washington, D. C.
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HENRY WELD FULLER, Roxbury.
R. W. FURNAS, President of the Nebraska State Horticultural Society, Brownville, Neb.
AUGUSTUS GANDE, President of the Horticultural Society, Department of , Sarthe, France.
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*BENJAMIN GARDNER, late U. S. Consul at Palermo.
*CAPT. JAMES P. GERRY, U. S. Navy.
*ABRAHAM P. GIBSON, late U. S. Consul at St. Petersburg.
*R. GLENDENNING, Chiswick, near London.
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PROF. ASA GRAY, Cambridge.
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*Abraham Halsey, New York.
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*Thaddeus William Harris, M. D., Cambridge.
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*Bernard Henry, Philadelphia.
Shirley Hibberd, Editor of the Gardeners' Magazine, London.
*J. J. Hitchcock, Baltimore.
Robert Hogg, LL. D., Editor of the Journal of Horticulture, London.
*Thomas Hogg, New York.
Thomas Hogg, New York.
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Fisher Holmes.
Sir Joseph Hooker, K. C. S. I., Director of the Royal Botanic Garden, Kew, England.
Josiah Hoopes, West Chester, Pa.
Prof. E. N. Horsford, Cambridge.
*Sanford Howard, Chicago, Ill.
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*Isaac Hurd, Cincinnati, Ohio.
George Husmann, Sedalia, Pettis County, Mo.
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Edward Jarvis, M. D., Dorchester.
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J. Linden, Ghent, Belgium.
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T. C. Maxwell, Geneva, N. Y.
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*Stephen Mills, Flushing, N. Y.
*Charles M'Intosh, Dalkeith Palace, near Edinburg.
J. E. Mitchell, Philadelphia.
*William S. M'Lean, New York.
Guiseppe Monarchini, M. D., Cauca, Isle of Candia.
Édouard Morren, Editor of the Belgique Horticole Liége, Belgium.
*Horatio Newhall, M. D., Galena, Ill.
*David W. Offley, U. S. Agent, Smyrna.
James Ombrosi, U. S. Consul, Florence.
*John J. Palmer, New York.
*Victor Paquet, Paris.
*John W. Parker, late U. S. Consul, Amsterdam.
*Andrew Parmentier, Brooklyn, N. Y.
William Paul, Waltham Cross, London, N.
*Sir Joseph Paxton, M. P., Chatsworth, England.
*John L. Payson, late U. S. Consul, Messina.
*Com. M. C. Perry, U. S. Navy.
*David Porter, late U. S. Chargé d' Affaires at the Ottoman Porte.
*Alfred S. Prince, Flushing, N. Y.
*William R. Prince, Flushing, N. Y.
P. T. Quinn, Newark, N. J.
Rev. Rushton Radcliffe.
*William Foster Redding, Baltimore, Md.
D. Redmond, Ocean Springs, Miss.
M. D. Reynolds, Schenectady, N. Y.
*John H. Richards, M. D., Illinois.
Charles V. Riley, Entomologist, St. Louis, Mo.
*Mons. J. Rinz, Jr., Frankfort-on-the-Main.
*Thomas Rivers, Sawbridgeworth, Herts, England.
William Robinson, Editor of The Garden, London.
*Dr. J. Smyth Rogers, New York.
*Capt. William S. Rogers, U. S. Navy.
Bernard Rosier, M. D., Athens, Greece.
*Thomas Rotch, Philadelphia.
*George R. Russell, Roxbury,
John B. Russell, Washington, D. C.
*Rev. John Lewis Russell, Salem.
William Saunders, Department of Agriculture, Washington, D. C.
*William Shaler, late U. S. Consul-General, Havana, Cuba.

*Caleb R. Smith, Burlington, N. J.
*Daniel D. Smith, Burlington, N. J.
*Gideon B. Smith, late Editor of the American Farmer, Baltimore.
John Jay Smith, Germantown, Pa.
*Horatio Sprague, late U. S. Consul, Gibraltar.
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Dr John Stayman, Leavenworth, Kansas.
*Thomas H. Stevens, U. S. Navy, Middletown, Conn.
William F. Strangeway, British Secretary of Legation at Naples.
Dr. J. Strentzel, Martinez, Cal.
*James P. Sturgis, Canton.
William Summer, Pomaria, S. C.
Francis Summerest.
*Prof. Tenore, late Director of the Botanic Garden at Naples.
*J. E. Teschemacher, Boston.
*Robert Thompson, London.
*George C. Thoreurn, New York.
Prof. George Thurber, Editor of the American Agriculturist, New York.
John Tilson, Jr., Edwardsville, Illinois.
Cav. Doct. Vincent Tinio, Director of the Botanic Garden at Palermo.
*Luther Tucker, Editor of the Cultivator, Albany, N. Y.
Carey Tyso, Wallingford, England.
*Louis Van Houtte, Ghent, Belgium.
*Alexander Vattemare, Paris.
*Emilien de Wael, Antwerp, Belgium,
John A. Warder, M. D., President of the Ohio State Horticultural Society, Cleves, O.
Anthony Waterer, Knapp Hill, near Woking, Surrey, England.
*J. Ambrose Wight, Editor of the Prairie Farmer, Chicago, Ill.
Benjamin Samuel Williams, Holloway, London, N.
Prof. John Wilson, Agricultural College, Cirencester, England.
*William Wilson, New York.
*Col. J. F. Wingate, Bath, Me.
*Joshua Wingate, Portland.
*Joseph Augustus Winthrop, Charleston, South Carolina.

MEMBERS FOR LIFE.

Change of residence, or any inaccuracies, should be promptly reported to the Secretary.

Adams, George E.,	Medford.	Bates, Amos,	Hingham.
Albro, Charles,	Taunton.	Bates, Caleb,	Kingston.
Alger, R. F.,	Dedham.	Bayley, John P.,	Boston.
Ames, F. L.,	Easton.	Beal, Alexander,	Dorchester.
Ames, F. M.,	Canton.	Beckford, D. R., Jr.,	Dedham.
Ames, George,	Boston.	Bell, Joseph H.,	Quincy.
Ames, P. A.,	"	Bemis, Emery,	Grantville.
Amory, Charles,	"	Berry, James,	Boston.
Amory, Frederick,	Brookline.	Bickford, Weare D.,	Allston.
Amory, James S.,	Boston.	Birchard, Charles,	Arlington.
Andrews, Charles L.,	Swampscott.	Black, J. W.,	Boston.
Andrews, Frank W.,	Boston.	Blagg, Samuel.	Newbern, N. C.
Andrews, W. T.,	"	Blanchard, J. W.,	Boston.
Andros, Milton,	Brookline.	Blaney, Henry,	Brookline.
Appleton, Edward,	Reading.	Blinn, R. D.,	Lexington.
Appleton, Francis H.,	Peabody.	Bocher, F.,	Boston.
Appleton, Wm. S.,	Boston.	Bockus, C. E.,	Dorchester.
Atkins, Elisha,	Belmont.	Bond, George W.,	Boston.
Austin, William R.,	Dorchester.	Borland, J. N.,	"
Avery, Edward,	Boston.	Botume, John,	Stoneham.
Ayer, Adams,	"	Bouvé, Thomas T.,	Boston.
Ayling, Isaac,	"	Bowditch, A. C.,	Somerville.
		Bowditch, J. Ingersoll,	Boston.
Bacon, George,	Brookline.	Bowditch, Wm. E.,	"
Bailey, Edwin C.,	Concord, N. H.	Brackett, C. H.,	Brighton.
Baker, Wm. E.,	Boston.	Brackett, C. N.,	Newton.
Bancroft, J. C.,	Milton.	Bradish, L. J.,	Boston.
Banfield, F. L.,	Boston.	Bragg, S. A. B.,	Mattapan.
Barnard, Rev. C. F.,	"	Breed, Andrews,	Lancaster.
Barnard, James M.,	"	Breed, Henry A.,	Lynn.
Barnard, R. M.,	Everett.	Bresee, Albert,	Hortonville, Vt.
Barnes, Walter S.,	Somerville.	Brewer, John Reed,	Boston.
Barnes, Wm. H.,	Boston.	Brewer, Otis,	"
Barney, Levi C.,	"	Brigham, W. T.,	"
Barratt, James,	Cambridge.	Bright, Jona. B.,	Waltham.
Barrett, Aaron,	Malden.	Bright, William E.,	"
Barrows, Thomas,	Dedham.	Brimmer, Martin,	Boston.
Bartlett, E.,	Newburyport.	Brintnall, Benj.,	"

Brooks, Francis,	Medford.	Clapp, Lemuel,	Dorchester.
Brooks, J. W.,	Milton.	Clapp, William C.,	"
Brooks, Peter C.,	Boston.	Clark, Orus,	Boston.
Brown, Charles E.,	Yarmouth, N.S.	Clark, W. L.,	Neponset.
Brown, Edward J.,	Brookline.	Clark, William S.,	Amherst.
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Brown, George B.,	"	Clay, Henry,	Dorchester.
Brown, Jacob,	Woburn.	Cleary, Lawrence,	West Roxbury.
Brownell, E. S.,	Essex Junc., Vt.	Clement, Asa,	Dracut.
Bruce, N. F.,	Stoneham.	Cleveland, Ira,	Dedham.
Buckminster, W. J.,	Malden.	Cobb, Albert A.,	Brookline.
Bullard, Wm. S.,	Boston.	Coburn, Isaac E.,	Everett.
Burnett, Joseph,	Southborough.	Codman, James M.,	Brookline.
Burnham, T. O. H. P.,	Boston.	Codman, Ogden,	Lincoln.
Burr, Fearing,	Hingham.	Coffin, G. Winthrop,	West Roxbury.
Burr, Matthew H.,	"	Coffin, William E.,	Boston.
Buswell, E. W.,	Boston.	Converse, E. S.,	Malden.
Buswell, Frank E.,	"	Coolidge, Joshua,	Watertown.
Butler, Aaron,	Wakefield.	Copeland, Franklin,	West Dedham.
Butterfield, Wm. P.,	Arlington.	Courtis, William,	Marblehead.
		Cox, George P.,	Malden.
Cadness, John,	Flushing, N. Y.	Coy, Samuel L.,	Boston.
Cains, William,	South Boston.	Craft, George,	Brookline.
Calder, A. P.,	Boston.	Crocker, Uriel,	Boston.
Capen, John,	"	Crosby, Josiah,	Arlington.
Carlton, Samuel A.,	Somerville.	Crowell, Philander,	Chelsea.
Carruth, Charles,	Boston.	Crowell, R. H.,	"
Carruth, Nathan,	Dorchester.	Cruickshanks, James,	"
Carter, Miss Sabra,	Wilmington.	Cummings, John,	Woburn.
Chamberlain, C. W.,	Arlington.	Curtis, Charles F.,	West Roxbury.
Chandler, J. G.,	S. Lancaster.	Curtis, George S.,	Jamaica Plain.
Chapin, N. G.,	Brookline.	Cushing, J. G.,	Boston.
Chapman, Edward,	Arlington.	Cushing, R. M.,	"
Chase, A. J.,	Lynn.		
Chase, Daniel E.,	Somerville.	Daggett, H. C.,	Boston.
Chase, Hezekiah S.,	Boston.	Damon, Samuel G.,	Arlington.
Chase, William M.,	Worcester.	Dana, Charles B.,	Brookline.
Cheney, B. P.,	Boston.	Darling, Charles K.,	Boston.
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Child, William C.,	Medford.	Davenport, Geo. E.,	Boston.
Childs, Francis,	Charlestown.	Davenport, Henry,	"
Childs, N. E.,	Dorchester.	Davis, Curtis,	Cambridge.
Claflin, Henry,	Brighton.	Davis, Hervey,	Cambridgeport.
Claflin, William,	Newton.	Dawson, Jackson,	West Roxbury.
Clapp, Edward B.,	Dorchester.	Deblois, S. G.,	Boston.
Clapp, E. W.,	Walpole.	Denny, C. H.,	"
Clapp, J. H.,	Dorchester.	Denny, R. S.,	Dorchester.

Denton, Eben,	Braintree.	Galvin, John,	West Roxbury.
DeWolf, John L.,	Boston.	Gardner, Henry N.,	Belmont.
Dewson, F. A.,	"	Gibbs, Wolcott,	Cambridge.
Dexter, F. Gordon,	"	Gilkey, R. F.,	Watertown.
Dickerman, Geo. H.,	Somerville.	Gillard, William,	Boston.
Dickinson, Alex.,	Cambridgeport.	Gilson, F. Howard,	Reading.
Dike, Charles C.,	Stoneham.	Glover, Albert,	Boston.
Dix, Joseph,	Boston.	Glover, Joseph B.,	"
Dorr, George,	Dorchester.	Goddard, A. Warren,	Brookline.
Dove, George W. W.,	Andover.	Goddard, Mrs. M. T.,	Newton.
Downer, Samuel,	Dorchester.	Gorham, J. L.,	Jamaica Plain.
Durant, H. F.,	Boston.	Gould, Francis,	Arlington.
Durant, William,	"	Gould, Samuel,	Boston.
Durfee, Mrs. F. B.,	Fall River.	Gray, James,	Wellesley.
Durfee, George B.,	"	Gregory, J. J. H.,	Marblehead.
		Greig, George,	Newton.
Eaton, Horace,	Quincy.	Grinnell, Joseph,	New Bedford.
Eldridge, E. H.,	Boston.	Groom, Thomas,	Dorchester.
Ellicott, J. P.,	Jamaica Plain.	Grundel, H.,	"
Endicott, Wm. E.,	Canton.	Guild, J. Anson,	Brookline.
Everett, George,	Concord.		
Everett, Otis,	Boston.	Hadwen, O. B.,	Worcester.
Everett, William,	"	Hall, Edwin A.,	Cambridgeport.
		Hall, George A.,	Chelsea.
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Feukes, Edwin,	Ipswich.	Hall, William F.,	Brookline.
Fillebrown, John,	Arlington.	Halliday, W. H.,	Boston.
Fisher, James,	Boston.	Hammond, Gard. G.,	"
Fisher, Warren,	"	Hammond, Samuel,	"
Flagg, Augustus,	"	Harding, C. L.,	Cambridge.
Fleming, Edwin,	West Newton.	Harding, G. W.,	Dorchester.
Fleming, William,	" "	Harding, L. B.,	Boston.
Fletcher, J. W.,	Chelsea.	Harding, W. C.,	"
Flint, Charles L.,	Boston.	Hardy, F. D., Jr.,	Cambridgeport.
Flint, D. B.,	Watertown.	Harris, Charles,	Cambridge.
Flynt, William N.,	Monson.	Hastings, Edm. T.,	Boston.
Foster, John H.,	Boston.	Hatch, Anthony,	Cliftondale.
Foster, J. W.,	Dorchester.	Hathaway, Seth W.,	Marblehead.
Fowle, W. B.,	Auburndale.	Haughton, James,	Boston.
Freeland, Chas. Wm.,	Boston.	Hayden, A. W.,	Portsm'th, N. H.
Freeman, Abraham,	Dorchester.	Hayes, Daniel F.,	Exeter, N. H.
French, Jonathan,	Boston.	Hayes, Francis B.,	Boston.
French, J. D. W.,	"	Hazeltine, H.,	"
Fuller, Henry Weld,	"	Head, Charles D.,	Brookline.

Hilbourn, A. J.,	Chelsea.	Keyes, E. W.,	Denver, Col.
Hill, George,	Arlington.	Keyes, George,	Concord.
Hill, John,	Stoneham.	Kidder, H. P.,	Boston.
Hitchings, E. H.,	Boston.	Kimball, A. P.,	"
Hodgkins, John E.,	Chelsea.	King, Franklin,	Dorchester.
Hollis, J. W.,	Brighton.	King, William S.,	Boston.
Holt, Mrs. S. A.,	Winchester.	Kingman, A. A.,	Brookline.
Hooper, Robert C.,	Boston.	Kingman, C. D.,	Middleborough.
Hooper, Thomas,	Bridgewater.	Kinsley, Lyman,	Cambridgeport.
Horner, Mrs. C. N. S.,	Georgetown.	Kittredge, E. A.,	Boston.
Hovey, C. H.,	Cambridge.		
Hovey, C. M.,	"	Lamb, Thomas,	Boston.
Hovey, John C.,	Cambridgeport.	Lancaster, C. B.,	Newton.
Hovey, P. B.,	"	Lawrence, Amos A.,	Brookline.
Howe, George,	Boston.	Lawrence, Edward,	Charlestown.
Howland, John, Jr.,	New Bedford.	Lawrence, James,	Boston.
Hubbard, Charles T.,	Boston.	Lawrence, James,	Groton.
Hubbard, G. G.,	Cambridge.	Lawrence, John,	Boston.
Hubbard, J. C.,	Boston.	Lawson, Peter,	Lowell.
Hubbard, W. J.,	"	Leavens, S. Davis,	Boston.
Huckins, J. W.,	"	Lee, Henry,	"
Humphrey, F. J.,	Dorchester.	Lemme, Frederick,	Natick.
Hunneman, Jos. H.,	Boston.	Leuchars, R. B.,	Boston.
Hunnewell, H. H.,	Wellesley.	Lewis, A. S.,	Framingham.
Hunt, Franklin,	Boston	Lewis, William G.,	"
Hunt, Moses,	"	Lincoln, D. Waldo,	Worcester.
Hyde, J. F. C.,	Newton.	Lincoln, George,	Hingham.
		Locke, W. H.,	Belmont.
Inches, Henderson,	Boston.	Lodge, Giles H.,	Swampscott.
Inches, Herman B.,	"	Loftus, John P.,	Boston.
		Loomis, J. B.,	Chelsea.
Jackson, Abraham,	Boston.	Lord, George C.,	Newton.
Janvrin, W. S.,	Revere.	Loring, Alfred,	South Hingham.
Jeffries, John, Jr.,	Boston.	Loring, C. W.,	Boston.
Jenks, C. W.,	"	Lothrop, Eben W.,	Chelsea.
Johnson, Francis M.,	Newton Centre.	Lovett, G. L.,	Boston.
Joyce, Mrs. Samuel,	Medford.	Low, Ariel,	"
		Lowder, John,	Watertown.
Kakas, Edward,	Medford.	Lowell, Augustus,	Boston.
Kelley, E. G.,	Newburyport.	Luke, Elijah H.,	Cambridgeport.
Kendall, D. S.,	Woodstock, Ont.	Lumb, Wm.,	Boston.
Kendall, Edward,	Cambridgeport.	Lunt, C. H.,	Jamaica Plain.
Kendall, J. R.,	Woburn.	Lyman, Theodore,	Brookline.
Kendrick, Mrs. H. P.,	Allston.	Lyon, Henry,	Charlestown.
Kennedy, G. G.,	Boston.		
Kenney, John M.,	Wareham.	Mahoney, John,	Boston.
Kent, John,	Charlestown.	Mann, James F.,	Cambridge.

Mann, Jonathan,	Cambridge.
Manning, J. W.,	Reading.
Manning, Mrs. L. B.,	"
Manning, Robert,	Salem.
Mansfield, H. S.,	Blackstone.
Marland, A.,	Andover.
Marsh, Francis,	Dedham.
Marshall, Frederick,	Everett.
Martin, D. A.,	Chelsea.
Martin, J. S.,	Boston.
Mason, R. M.,	"
Matthews, Nathan,	"
McCarthy, T.,	"
McClure, John,	Revere.
Merriam, M. H.,	Lexington.
Merrifield, W. T.,	Worcester.
Miller, E. D.,	Dorchester.
Mills, Charles H.,	Boston.
Milmore, M.,	"
Milton, W. H.,	"
Minott, Charles,	Somerville.
Minton, James,	Dorchester.
Mixter, Charles,	Boston.
Moore, John B.,	Concord.
Morrill, Joseph, Jr.,	Boston.
Morse, S. B.,	"
Morse, Samuel F.,	"
Motley, Thomas,	West Roxbury,
Mudge, E. R.,	Swampscott.
Mudge, George A.,	Brookline.
Mudge, George W.,	Lynn.
Munroe, Otis,	Boston.
Needham, Daniel,	Groton.
Newhall, Cheever,	Dorchester.
Newhall, George,	"
Newhall, Josiah,	Lynnfield.
Newman, J. R.,	Winchester.
Newton, W. W.,	Brookline.
Nichols, Mrs. F.,	Dorchester.
Nourse, Benjamin F.,	Cambridgeport.
Nourse, B. F.,	Boston.
Osgood, Jas. Ripley,	Boston.
Otis, T. C.,	"
Oxnard, George D.,	"
Packer, C. H.,	Boston.
Page, Thomas,	Milwaukee.
Paine, Robert T.,	Boston.
Palmer, J. P.,	"
Park, J. C.,	Somerville.
Parker, Augustus,	Boston.
Parker, William A.,	"
Parkman, Francis,	Jamaica Plain.
Partridge, Henry,	Dunkirk, N. Y.
Partridge, Horace,	Somerville.
Pearce, John,	West Roxbury.
Peck, O. H.,	Franklin.
Peck, W. G.,	Arlington.
Penniman, A. P.,	Waltham.
Perkins, Augustus T.,	Boston.
Perkins, Edward N.,	Brookline.
Perkins, William P.,	"
Perry, George W.,	Malden.
Philbrick, William D.,	Newton Centre.
Pierce, George W.,	Everett.
Pierce, Henry L.,	Dorchester.
Pierce, S. B.,	"
Poole, Benjamin C.,	Chelsea.
Poor, John R.,	Somerville.
Pope, Alexander,	Dorchester.
Potter, Joseph S.,	Arlington.
Prang, L.,	Boston.
Pratt, Robert M.,	"
Pratt, William,	Winchester.
Pray, Mark W.,	Malden.
Prescott, C. H.,	Cornwallis, N. S.
Prescott, Eben C.,	Boston.
Prescott, W. G.,	"
Prescott, William G.,	Quincy.
Preston, George H.,	Boston.
Preston, John,	Dorchester.
Pringle, C. G.,	Charlotte, Vt.
Proctor, Thomas P.,	West Roxbury.
Prouty, Gardner,	Littleton.
Putnam, Joshua H.,	Brookline.
Ramsay, A. H.,	Cambridge.
Rand, Miss E. L.,	Newton.
Rand, E. S.,	Boston.
Rand, Oliver J.,	Cambridgeport.
Rawson, W. W.,	Arlington.

Rayner, John J.,	Lexington.	Smith, James H.,	Needham.
Reed, George W.,	Boston.	Smith, Joshua B.,	Cambridgeport.
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Richards, William B.,	"	Smith, W. B.,	Boston.
Richardson, C. E.,	"	Snow, Eben,	Cambridge.
Richardson, Geo. C.,	Cambridge.	Southmayd, John K.,	Boston.
Robbins, I. Gilbert,	Boston.	Sparhawk, Edwd. C.,	Brighton.
Robbins, Nathan,	Arlington.	Sparhawk, Geo.,	Lexington.
Robeson, W. R.,	Boston.	Spaulding, Edward,	Jamaica Plain.
Robinson, John,	Salem.	Spaulding, M. D.,	Boston.
Robinson, J. H.,	Dorchester.	Speare, Alden,	Newton Centre.
Rogers, John H.,	Boston.	Springall, George,	Malden.
Ross, Henry,	Newton.	Springer, John,	Sterling.
Ross, M. D.,	Boston.	Stetson, James A.,	Quincy.
Ross, Waldo O.,	"	Stetson, Nahum,	Bridgewater.
Russell, George,	W. Somerville.	Stickney, Rufus B.,	Somerville.
Russell, N. P.,	Boston.	Stimpson, George,	New York.
Russell, Walter,	Arlington.	Stimpson, H. H.,	Cambridge.
		Stone, Amos,	Everett.
Sampson, G. R.,	New York.	Stone, G. F.,	Newton.
Sanborn, Amos C.,	Cambridgeport.	Stone, Phineas J.,	Charlestown.
Sandford, O. S.,	Cordaville.	Story, E. A.,	Brighton.
Sargent, Charles S.,	Brookline.	Strong, William C.,	"
Sargent, Ignatius,	"	Sturgis, John H.,	Boston.
Saville, R. L.,	Brookline.	Sturgis, Russell, Jr.,	"
Sawyer, E. H.,	Easthampton.	Sturtevant, E. Lewis,	S. Framingham.
Sawyer, Timothy T.,	Charlestown.	Sumner, Edward,	Dedham.
Scott, Charles,	Newton.	Surette, L. A.,	Concord.
Scudder, C. W.,	Brookline.	Swain, Charles D.,	Roxbury.
Seaver, Nathaniel,	East Boston.		
Seaver, Robert,	Jamaica Plain.	Taft, John B.,	Boston.
Shaw, C. C.,	Boston.	Tappan, Charles,	"
Shaw, S. P.,	Cambridge.	Taylor, Horace B.,	"
Sheafe, Charles C.,	Boston.	Thacher, Alfred C.,	Dorchester.
Sheafe, William,	Brookline.	Thayer, Henry,	N. Cambridge.
Sheldon, O. S.,	Milton.	Thayer, Nathaniel,	Boston.
Shimmin, Charles F.,	Boston.	Thompson, S. Benton,	Lexington.
Shorey, John L.,	Lynn.	Thorndike, John H.,	Boston.
Skinner, Francis,	Boston.	Thurlow, T. C.,	Newburyport.
Slack, Chas. W.,	"	Tilton, Stephen W.,	Boston.
Slack, Lewis,	Brookline.	Todd, John,	Hingham.
Smith, Benj. G.,	Cambridge.	Tolman, Benj.,	Concord.
Smith, Charles A.,	Boston.	Tolman, Miss H. S.,	Boston.
Smith, Charles H.,	Jamaica Plain.	Torrey, Everett,	Charlestown.
Smith, Chauncy,	Cambridge.	Turner, J. M.,	Dorchester.
Smith, E. N.,	Boston.	Turner, R. W.,	Newton.
Smith, George O.,	"	Turner, Royal W.,	Randolph.

Underwood, Guy C.,	Boston.	Wheelwright, A. C.,	Boston.
Upham, Henry,	Brookline.	Whipple, John A.,	"
		Whitcomb, Wm. B.,	Medford.
Vass, W. J.,	Boston.	White, B. C.,	Boston.
Vinton, A. H., D. D.,	"	White, Edward A.,	"
Vose, B. C.,	Hyde Park.	White, Francis A.,	Brookline.
		Whitely, Edward,	Cambridge.
Wainwright, Peter,	Boston.	Whiting, Nathaniel,	Brookline.
Wainwright, Wm. L.,	Braintree.	Whitmore, C. O.,	Boston.
Wakefield, E. H.,	Chelsea.	Whitney Luther F.,	Charlestown.
Walcott, Edward,	Pawtucket.	Whittle, George W.,	Somerville.
Walcott, Henry P.,	Cambridge.	Whytal, Thomas G.,	West Roxbury.
Walker, Edw. C. R.,	Boston.	Wilbur, G. B.,	Watertown.
Walker, Samuel A.,	"	Wilcutt, Levi L.,	West Roxbury.
Walker, T. W.,	Waltham.	Wilder, Henry A.,	Boston.
Walley, Mrs. W. P.,	Boston.	Wilder, Marshall P.,	Dorchester.
Ward, John,	Newton.	Williams, Aaron D.,	Boston.
Wardwell, W. H.,	" Centre.	Williams, Benj. B.,	"
Ware, Benjamin P.,	Marblehead.	Williams, Philander,	Taunton.
Warren, G. W.,	Boston.	Willis, George W.,	Chelsea.
Wason, E.,	Brookline.	Willis, J. C.,	Boston.
Waters, Edwin F.,	Newton Centre.	Wilson, Henry W.,	South Boston.
Waters, George F.,	Newton.	Winship, F. Lyman,	Brighton.
Watts, Isaac,	Belmont.	Winship, Herman,	"
Webber, A. D.,	Boston.	Woerd, C. V.,	Waltham.
Weld, Aaron D.,	West Roxbury.	Woerd, C. V., Jr.,	"
Weld, Dr. M. W.,	Boston.	Wood, L. H.,	Marlborough.
Weld, Richard H.,	"	Wood, R. W.,	Jamaica Plain.
Weld, W. G.,	Brookline.	Wood, Wm. K.,	West Newton.
Weston, L. W.,	Lincoln.	Woodward, Royal,	Brookline.
Weston, Seth,	Revere.	Wright, George C.,	West Acton.
Wetherell, Leander,	Boston.	Wrisley, Frank,	New York.

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Adams, Chas. F.,	Quincy.
Adams, C. S.,	Framingham.
Allen, Andrew F.,	Arlington.
Allen, Calvin,	Boston.
Allen, E. L.,	"
Allen, Nathaniel T.,	West Newton.
Allen, W. H.,	Dedham.
Alley, Franklin,	Marblehead.
Ames, R. W.,	Boston.
Anderson, C. J.,	Longwood.
Atkinson, Chas. M.,	Brookline.
Atkinson, Edward,	"
Atkinson, John,	West Newton.
Atkinson, W. B.,	Newburyport.
Batchelder, Samuel,	Cambridge.
Bacon, Augustus,	Boston.
Bacon, William,	"
Baker, W. P.,	Quincy.
Bard, James,	Framingham.
Barker, John G.,	Lynn.
Barnard, Mrs. Joel,	Arlington H'ts.
Barnes, Parker,	Dorchester.
Bayley, Dudley H.,	Boston.
Beard, E. L.,	Cambridge.
Becker, Frank,	Belmont.
Bird, Charles,	Revere.
Bird, John L.,	Dorchester.
Black, John A.,	Boston.
Bliss, B. K.,	New York.
Bolles, Matthew,	West Roxbury.
Bolles, William P.,	Boston.
Bolton, John B.,	Somerville.
Boot, William,	Boston.
Bouvé, Ephraim W.,	"
Brackett, E. A.,	Winchester.
Bradford, Chas. F.,	Boston.
Bradlee, John D.,	Milton.
Bradlee, J. T.,	Boston.
Breck, C. H.,	Brighton.
Breck, C. H. B.,	"
Brewer, Thomas M.,	Boston.
Brooks, George,	Brookline.
Brown, A. S.,	Jamaica Plain.
Brown, Atherton T.,	Boston.
Brown, Jona., Jr.,	Somerville.
Brown, Joseph T.,	Boston.
Bryant, G. J. F.,	"
Bull, E. W.,	Concord.
Bullard, Calvin,	Boston.
Burley, Edward,	Beverly.
Burr, Charles C.,	Newton.
Butler, Edward,	Wellesley.
Capen, Aaron D.,	Mattapan.
Carter, Maria E.,	Woburn.
Cartwright, James,	Wellesley.
Chadbourne, M. W.,	Watertown.
Chaffin, John C.,	Newton.
Chase, Mrs. C. B.,	Medford.
Chase, Henry L.,	Lynn.
Cheney, A. P.,	Natick.
Clark, James W.,	Framingham.
Clark, Joseph,	Canton.
Clark, Joseph W.,	Dedham.
Cobb, Edward W.,	Boston.
Cobb, Jonathan H.,	Dedham.
Coe, Henry F.,	West Roxbury.
Colby, E. P.,	Wakefield.
Cole, H. Hammond,	Chelsea.
Comley, James,	Lexington.
Converse, Parker L.,	Woburn.
Cox, James F.,	Abington.
Crafts, W. A.,	Boston.
Cruickshank, J. T.,	Natick.
Curtis, D. T.,	Boston.
Curtis, Joseph H.,	"
Cutter, George B.,	Weston.

Dana, Luther,	Newton.	Gardner, John,	Dedham.
Darling, Moses, Jr.,	South Boston.	Garfield, Charles,	Medford.
Davis, Frederick,	Newton.	Gaut, S. N.,	Somerville.
Davis, James,	Boston.	Gerry, Charles F.,	Hyde Park.
Davis, Thomas M.,	Cambridgeport.	Gilbert, John,	Boston.
Day, George B.,	Boston.	Gilbert, Samuel,	"
Dean, A. J.,	"	Gilbert, W. A.,	Neponset.
Denison, J. N.,	"	Gill, Mrs. E. M.,	Medford.
Dike, George W.,	Stoneham.	Gleason, C. W.,	Boston.
Dillaway, Chas. K.,	Boston.	Gleason, Herbert,	Malden.
Doogue, William,	"	Godbold, G. A.,	Chelsea.
Downe, Sumner,	Malden.	Goddard, Thomas,	Boston.
Downes, Mrs. S. M.,	Andover.	Goodwin, Lester,	Brighton.
Dupee, James A.,	Brookline.	Gove, George G.,	Cambridge.
Dwight, David F.,	Boston.	Grant, Charles E.,	Boston.
Dyer, Mrs. E. D.,	Eyota, Minn.	Graves, Frank H.,	West Newton.
		Gray, Edward,	Boston.
Eaton, Jacob,	Cambridgeport.	Gray, Howard,	Dorchester.
Eaton, Russell P.,	Dorchester.	Gray, John C.,	Boston.
Edgar, William,	Newtonville.	Gray, Wm., Jr.,	Dorchester.
Eustis, James,	Wakefield.	Gray, Wm., 3d,	"
Ewings, L. B.,	Boston.	Greenwood, E. H.,	Newton Centre.
		Grew, Henry,	Dorchester.
Falconer, James,	Boston.	Guerineau, Louis,	Malden.
Falconer, John,	Rochester.		
Falconer, William,	Cambridge.	Hadley, T. B.,	Stoneham.
Farrier, Amasa,	Stoneham.	Haines, Robert J.,	Boston.
Farrier, Mrs. C.,	"	Haley, Jesse,	Cambridgeport.
Fay, Henry G.,	Brookline.	Hall, William T.,	Revere.
Felton, A. W.,	West Newton.	Hamlin, D. A.,	South Boston.
Fenno, Thomas L.,	Somerville.	Harris, Miss Ellen M.,	Jamaica Plain.
Fenno, Warren,	Revere.	Harris, F. L.,	West Needham.
Fletcher, Edwin,	Acton.	Hartwell, Samuel,	Lincoln.
Foley, Bernard,	Boston.	Harwood, Geo. S.,	Newton.
Foster, Joshua T.,	Medford.	Haskell, Edward,	New Bedford.
Foster, Nath'l, Jr.,	Belmont.	Hatch, Samuel,	Boston.
Fowle, H. D.,	Boston.	Hayes, John L.,	Cambridge.
French, Henry F.,	Concord.	Hayward, Geo. P.,	Hingham.
French, W. E.,	Boston.	Hayward, James T.,	Boston.
Frost, George,	West Newton.	Hazelton, H. L.,	"
Frost, Rufus S.,	Chelsea.	Heath, Geo. W.,	Melrose.
Frost, Stiles,	West Newton.	Heustis, Warren,	Belmont.
Fuller, W. G.,	Stoneham.	Hews, Albert H.,	No. Cambridge.
Furneaux, Charles,	Melrose.	Higbee, C. H.,	Salem.
		Hill, Benj. D.,	Peabody.
Gane, Henry A.,	West Newton.	Hill, Henry Y.,	Belmont.
Gardiner, Claudius B.,	Newburyport.	Hinckley, Mrs. D. F.,	Chelsea.

Hittinger, Miss M. E.,	Belmont.
Hodgdon, R. L.,	Arlington.
Howe, Rufus,	Marlboro'.
Hubbard, J. W.,	Boston.
Humphrey, G. W.,	Dedham.
Humphrey, John,	Dover.
Ireland, George W.,	Somerville.
Jameson, G. W.,	East Lexington.
Johnson, H. A.,	Jamaica Plain.
Jones, Moses,	Brookline.
Jordan, Samuel,	Yarmouth.
Kelsey, Fred W.,	Waverly, N. Y.
Kendall, Jonas,	Framingham.
Kennard, M. P.,	Brookline.
Kenrick, Miss A. C.,	Newton.
Kingman, Abner,	Boston.
Lamprell, Simon,	Marblehead.
Lang, John H. B.,	Dorchester.
Langworthy, I. P.,	Chelsea.
Law, G. A.,	Roslindale.
Leavens, E. W.,	Malden.
Lee, Francis H.,	Salem.
Lincoln, F. W., Jr.,	Boston.
Livermore, Isaac,	Cambridgeport.
Livermore, Miss Maria,	Mt. Auburn.
Locke, B. D.,	Arlington.
Loring, Charles G.,	Boston.
Loring, John A.,	"
Lothrop, D. W.,	West Medford.
Lothrop, H. A.,	Sharon.
Lothrop, Thornton K.,	Boston.
Lowell, John,	Newton,
Markoe, G. F. H.,	Boston.
May, F. W. G.,	"
McDermott, Andrew,	"
McIntire, Joseph,	Melrose.
McIntyre, James,	Malden.
McLaren, Anthony,	Forest Hills.
Mellen, George M.,	Brookline.
Merrick, John M.,	Walpole.
Merrill, J. Warren,	Cambridgeport.
Merrill, S. A.,	Danvers.
Millar, John L.,	Boston.
Miller, David,	"
Mills, William,	Somerville.
Minton, P. J.,	Forest Hills.
M'Intosh, A. S.,	Boston.
Morandi, Francis,	Malden.
Morris, Thomas D.,	Boston.
Morrison, Hugh,	Gloucester.
Morse, E. R.,	Somerville.
Morse, W. A.,	Boston.
Morton, J. H.,	"
Murray, Daniel C.,	Brookline.
Muzzey, A. B.,	Cambridge.
Nichols, J. R.,	Haverhill.
Northey, William,	Medford.
Norton, P.,	Boston.
Noyes, George N.,	Auburndale.
Nugent, James,	Boston.
O'Brien, James,	Jamaica Plain.
Odiorne, F. H.,	Malden.
Oldreive, Richard,	Newton.
Olney, Richard,	West Roxbury,
Owen, John,	Cambridge.
Paine, Benjamin F.,	Boston.
Palmer, Stevens G.,	"
Park, W. D.,	"
Parker, Harvey D.,	"
Parker, James M.,	Charlestown.
Parker, John,	Boston.
Parsons, William,	"
Parsons, William B.,	Rockport,
Patterson, James,	Cambridge.
Payson, Samuel R.,	Boston.
Perkins, S. C.,	Dorchester.
Pettingill, Thos. S.,	Brookline.
Philbrick, Edward S.,	Boston.
Phillips, Nathaniel,	Dorchester.
Pillsbury, H. H.,	Medford.
Plimpton, W. P.,	West Newton.
Power, Charles J.,	S. Framingham.
Pratt, L. G.,	West Newton.
Pratt, Samuel,	Chelsea.

Preston, Jonathan,	Boston.
Prince, F. O.,	Winchester.
Putnam, C. A.,	Salem.
Putnam, Francis,	"
Putnam, H. W.,	"
Rand, George C.,	Newton Centre.
Randall, Macey,	Sharon.
Ranlett, Charles A.,	Billerica.
Ranlett, S. A.,	Melrose.
Ray, Edwin,	Boston.
Richards, Francis,	"
Richards, John S.,	Brookline.
Richardson, E. P.,	Lawrence.
Richardson, Horace,	Framingham.
Roberts, Edward,	Hyde Park.
Rogers, John F.,	Cambridge.
Russell, George,	Boston.
Saunders, Miss M. T.,	Salem.
Saville, George,	Quincy.
Sawtell, J. M.,	Fitchburg.
Schlegel, Adam,	Boston.
Scott, A. E.,	Lexington.
Scott, George H.,	Allston.
Scudder, Samuel H.,	Cambridge.
Shattuck, F. R.,	Boston.
Shaughnessy, J. J.,	"
Shedd, Abraham B.,	Lexington.
Shedd, Arthur B.,	"
Shepherd, C. W.,	West Newton.
Shepherd, Edwin,	Lowell.
Sherman, Japhet,	Medford.
Simpson, Michael H.,	Saxonville.
Sleeper, J. S.,	Boston.
Smallwood, Thomas,	Newton.
Snow, E. A.,	Melrose.
Southworth, Edward,	Quincy.
Spooner, W. H.,	Jamaica Plain.
Sprague, Charles J.,	Boston.
Squire, J. P.,	Arlington.
Stanwood, E. Howard,	Grantville.
Starbird, Louis D.,	Malden.
Stearns, Charles,	Brookline.
Stone, Eliphalet,	Dedham.
Stone, Milton J.,	Brookline.
Stone, Samuel G.,	Charlestown.
Story, Miss Sarah W.,	Brighton.
Sullivan, J. L. D.,	Somerville.
Swan, C. W.,	Boston.
Tailby, Joseph,	Wellesley.
Tainter, A. E.,	Medford.
Talbot, Josiah W.,	Norwood.
Tapper, Thomas,	Canton.
Taylor, Moses,	Acton.
Thompson, G. M.,	Waltham.
Tobey, Miss M. B.,	Brookline.
Todd, Jacob,	Boston.
Torrey, Augustus,	Beverly.
Tower, Elisha,	Lexington.
Trautman, Martin,	Boston.
Tucker, E. G.,	"
Turner, N. W.,	Everett.
Underwood, Wm. J.,	Belmont.
Vandine, Henry,	Cambridgeport.
Van Voorhies, H. W.,	Everett.
Vinton, Mrs. C. A.,	Boston.
Walker, Charles H.,	Chelsea.
Walker, Joseph T.,	Boston.
Walker, Wm. P.,	Somerville.
Wallis, William,	Boston.
Walsh, M. H.,	Brighton.
Waltham, George,	Nahant.
Ward, Edward A.,	Cambridge.
Warren, Samuel D.,	Waltham.
Washburn, E. F.,	Neponset.
Watson, B. M.,	Plymouth.
Watson, David,	Malden.
Webster, John,	Salem.
Wellington, Chas. A.,	E. Lexington.
Wellington, Jos. V.,	Cambridge.
Wells, Benjamin T.,	Boston.
Weston, Mrs. L. P.,	Danvers.
Wetherell, John G.,	Boston.
Wheatland, Henry,	Salem.
Wheeler, Miss Ann C.	Cambridgeport.
Wheildon, Wm. W.,	Concord.
White, N. B.,	Norwood.
White, T. C.,	Charlestown.
Whitney, Joel,	Winchester.

Wilde, Hiram,	Randolph.	Wood, Mrs. Anna D.,	West Newton.
Williams, Dudley,	Jamaica Plain.	Wood, Miss C. S.,	" "
Williams, Stephen,	Boston.	Wood, E. W.,	" "
Wilmarth, H. D.,	Jamaica Plain.	Woodford, Jos. H.,	Newton.
Wilson, B. O.,	Watertown.		
Wilson, George W.,	Malden.	Young, Thos., Jr.,	Somerville.
Wiswall, Henry M.,	Watertown.		
Wolcott, Mrs. J. W.,	Boston.	Zirngiebel, D.,	Needham.

EXTRACTS FROM THE BY-LAWS.

SECTION XXVI.—Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments; and any member, having once paid an admission fee, may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVII.—Admission Fee and Annual Assessment.

Every subscription member, before he receives his Diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIX.—Discontinuance of Membership.

Any member who shall neglect for the space of two years to pay his annual assessment shall cease to be a member of the Society; and the Treasurer shall erase his name from the List of Members.

The attention of Annual Members is particularly called to Section XXIX.

ERRATA.

Part I., 1877, page 67, line 24, for "is a moth," read "becomes a moth."
Page 68, line 29, for "Townsend," read "Townend."

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1878.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1878.

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The Committee on Publication and Discussion take this opportunity to repeat what they have heretofore stated, that the Society is not to be held responsible for the certainty of the statements, or the correctness of the opinions expressed in the papers and discussions now or before published; but undertakes only to present these papers and discussions, or the substance of them, correctly. The award of a prize or gratuity for an Essay is not to be understood as implying that the Committee approve it in every particular, but only that they believe it calculated, *on the whole*, to promote the science or art of Horticulture.

WILLIAM C. STRONG, *Chairman.*

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 5, 1878.

A duly notified stated meeting of the Society was holden at 11 o'clock, and was called to order by Francis Parkman, the retiring President, who reviewed the history of the Society during the three years of his administration, and introduced the President elect, William Gray, Jr., in the following address:

ADDRESS OF PRESIDENT FRANCIS PARKMAN.

Ladies and Gentlemen:

My official relations with you, as President of our Society, end today, though I am happy to feel that my personal relations with you will remain unaltered. During the term of my office, some changes and developments have taken place, of which it may be well to note the principal points. I spoke at our last annual meeting of the organic changes in the laws of the Society, so that it is needless to dwell on them now, farther than to observe that they have resulted in increased efficiency, harmony, and security, and have supplied what was before extremely defective, if not entirely wanting, — a means of redress to those who have grievances to complain of. In this consists one of the chief functions of the Executive Committee, as now constituted. It is its duty to give hearing to every complaint, and see that justice is done; yet every

person who may prefer to appeal directly to the Society itself, remains, as before, perfectly free to do so.

The character of our exhibitions may be taken as the best measure of our progress. In many respects they have distinctly improved. In the ornamental departments, the improvement has been, at some points, a very marked one. Such superb specimens of pot-grown plants as were seen last September in our Hall, were never seen there before. There has been great zeal, on the part of both amateur and professional cultivators, in the introduction of new and rare varieties. Much, too, has been done in the raising of seedlings. But nowhere has there been more improvement than in the show of roses, which has far surpassed that of former years, both in the perfection of single flowers, and in the specimens grown in pots. This last is a feature of our exhibitions, which till recently, could hardly be said to exist. What are known as "general displays" have held a less prominent place than formerly, and the Flower Committees have shown a just sense of the interests of high culture by rewarding quality rather than quantity.

The culture of fruits, and vegetables, being far better developed in this country than that of flowers, does not afford the same scope for improvement. In some particulars, the farthest progress seems to be reached already. In pears, for example, it would be hardly reasonable to expect any conspicuous improvement from year to year. In grapes, again, the case is different; and let us hope that our exhibitors will not rest content till they have equalled, at least under glass, the highest results of European culture.

In regard to all our exhibitions, and, in fact, all our proceedings, the great danger is of getting into ruts and staying there. We offer prizes to stimulate progress, and sometimes the purpose is very well answered. But no observing person can frequent our exhibitions without seeing that, in certain departments, there is a tiresome routine, week after week and year after year. He sees cards marked "First Prize," "Second Prize," "Gratuity," etc., placed against objects neither better nor different from those he had seen distinguished in the same way four or five years before. In these cases, and they are too numerous, the Society misses its mark and throws away the means that ought to be used to promote a true progress. He who presses onward should win the prize, and not he who follows his own tracks in a circle. If the committees will firmly withhold prizes unless there is positive merit in the object

exhibited, they will have more money left for those who deserve it, and will greatly help the Society to fulfil its mission. In cases where there has been no perceptible improvement for a long time, it might be well to suppress the prize altogether for a year or two.

The discussions on horticultural subjects have been of great service, and are, in my opinion, one of the best of the new features lately added to the Society. Much as they have done for us already, they are capable of doing far more. With us, as with all horticultural or agricultural clubs or societies, discussion is subject to the same evil that besets our exhibitions. It is apt to go round with the same persons, in the same groove, keeping all the time at about the same level of intelligence and knowledge, and so fail to gain its real object, which is to develop those habits of investigation and reflection, without which the horticulturist can never be master of his craft. Now I do not say that our discussions have been of this barren sort. On the contrary, I think that they have done real good. But, judging by former years — for during the last I have unfortunately been unable to attend them — they might be made to do a great deal more good. If members would more generally share in them, preparing themselves beforehand to do so by recalling what their own experience may have taught them about the subject announced, and then, by means of books and journals, comparing their own results with those reached by others, our discussions would become a powerful means of stimulating observation and thought.

Two other experiments have been made of late in connection with the discussions, and with similar objects. Prizes have been offered for Essays; and persons of known ability, not always members of the Society, have been invited to deliver lectures before it. Both experiments have had a good degree of success. Some of the lectures especially have been admirably suited to awaken interest and kindle a spirit of inquiry.

There has been great improvement in our printed Transactions, both in the quantity and quality of their contents, and in typographical and literary correctness.

The History of the Society, so long in preparation, is now substantially finished. It embodies a vast amount of information, and will be not only a minute record of our own history, but also an important contribution to that of American horticulture.

The Society has had its part in the financial depression of the

time, though by no means to the same degree as many other moneyed corporations. The restriction of income arising from this source and from the failure of the expected dividend from Mount Auburn, has been accepted by you in a spirit of patience and wisdom which, if continued, will ensure for us in its season a return of ample prosperity.

And now, ladies and gentlemen, I take leave of an office in which all my relations with you have been pleasant from beginning to end. I thank you heartily for the good will and friendliness you have shown towards me throughout, and I congratulate you no less heartily on your choice of my successor. This choice is in itself a promise of continued progress and fresh honor. Mr. President, I welcome you to your new office.

Mr. Gray, on taking the chair, delivered the annual address, as follows: —

Address of President William Gray, Jr.

Ladies and Gentlemen of the Horticultural Society:

On entering upon the duties of the office to which you have called me, I wish first to express my sense of the honor you have conferred. It is a place of responsibility and trust, and has in the past been filled so worthily that one may well feel anxious lest he fall below the high standard which his predecessors have established. That I will do the best that in me lies for the welfare of the Society, is all that I can say; and to enable me to do even this, I ask hearty and cordial assistance from you all.

I will not dwell on the past with which you are familiar. I would rather today look forward and see what in the future demands our attention; and first in regard to the financial condition of the Society.

In common with the whole country, we are suffering from the general depression of business; this affects our income, and the lessening of our means must be met by a corresponding reduction of our expenditures — a law which cannot be evaded with impunity by corporations or individuals. This enforced economy has, however, its compensations; it shows us how little of our real happiness depends on what can be bought with money; it forces us to find in ourselves, or in our previous acquisitions, elements of interest not suspected before; it will bring back in the course of time, perhaps

by many a hard experience, some of the habits of that old New England thrift, so much out of fashion of late. With us there has been a reduction of salaries, not because the services were worth the less, but because we could not pay the old rates. It has been accepted cheerfully by those most concerned, and we shall all rejoice when the time comes for restoring them to their old basis. The Schedule of Prizes has been thoroughly revised, and a considerable saving made in the amount offered for the coming year. We should remember how bountiful our Society has been in this respect when it had the means. The schedule of prizes for 1830 was $188, this has been increased from year to year with our prosperity, until in 1876 the amount was $6,800. For 1878 the amount is $4,575. Let us all look to it that there be no falling off in the exhibitions. It should be no question of dollars and cents; it is a question of the honor of our Society, which I trust will be upheld by its sons and daughters should it become necessary to suspend the prize list altogether.

We owe a debt here which can never be repaid; for a noble library, which few, as individuals, could afford to own; the opportunity week by week of seeing so much that is rare and beautiful in fruits and flowers; the meeting on common ground with those from every walk in life, brought together by a common love of Nature. And to many, perhaps, the lessons learned here have developed tastes which have been the sources of the purest and highest happiness of their lives.

I can feel no misgiving as to the future, if we are but true to ourselves. Let us consider what to-day is necessary to success in any department of human affairs. I should sum it all up by saying that to do one thing and that well — better if possible than any one else — in other words, to have a specialty and stand or fall by our success in that. This New England of ours is growing old; her fields, never rich, are less productive than ever; her sons do not take kindly to a farmer's life; you will see that the tide of population is steadily setting towards the large cities and manufacturing centres. This may not be an unmixed evil, but, unless the old out-of-door life is replaced by some taste or pursuit which shall relax the constant strain imposed by the modern system of society, it seems to me that New England has seen her best days. Such relaxation is within reach of us all, and is probably practised daily by all here.

I would say to you, Do what the manufacturers in this part of the country are doing — making specialties in their business. In the South, close to the cotton fields; in the West, close to the sheep farms, factories are being built to use the raw material where cheapest. Our factories, at a disadvantage because of the distance from their supplies, are making finer fabrics, in which labor is the larger part of the cost, using less cotton and wool, and more brains; and this must continue as the price of their success.

The same rule I hold to be true of horticulture; we must seek quality rather than quantity. With glass and coal and skill we can rival the tropics in the luxuriance of palm and fern, and set winter at defiance; but, do we do this well, that is, economically and to the best result? I should have to answer, No. There are some exceptions, but I think the general level is not a high one. People are too ambitious; they undertake too much; perhaps it would be more accurate to say that their love of plants is too strong for their judgment, and they fill a greenhouse, or plant their trees, and can never afterwards make up their minds to thin out. But whatever the cause, I think the fact cannot be disputed.

The remedy is plain if we will but apply it. The sum of human knowledge is growing unwieldly; there are more books written in a year than can be read in a lifetime; the real work is done, the real success attained, by those who give their lives to single objects. And this, I think, is what we should do, whether horticulture be the business of our life, or the relaxation from other pursuits — choose one department of it and excel in that; and not be content with anything short of the highest results that skill and energy and a single-hearted devotedness to the object of our choice, whatever that may be, can accomplish.

In closing, I must refer for a moment to the friend whom I succeed here, as a striking example of this principle. His life-work has been a specialty pursued under difficulties that none can fully appreciate. His relaxation has been in various specialties at various times. His histories will be the enduring monument of his success in the former, and in the latter, we all know how easily he has been first among us in whatever he has undertaken.

Marshall P. Wilder announced the death of Professor Jared P. Kirtland, LL. D., of East Rockport, Ohio, an Honorary Member of this Society, at the advanced age of eighty-four years; and said that Dr. Kirtland was one of the remarkable men of our age, and

for his scientific investigations and practical labors in a wide field in natural history, for more than fifty years, he has left a fame rarely achieved. As a horticulturist and botanist, he has been constantly at work for this long period, and his success in the production of new varieties of fruits and flowers is widely known, and the results of his labors are to be found in the gardens and orchards of our country. He gave special attention to crossing the grape, raspberry, and other fruits, particularly the cherry. The same might be said of his efforts in the hybridization of the tree pæony, one of the seedlings of which he dedicated to the speaker. He was exceedingly successful in grafting and budding the magnolia, and has left, surrounding his residence, very large trees of many rare foreign kinds which are difficult to propagate. He created the Cleveland Society of Natural History, and was for a long course of years its President. He was chosen a member of the American Philosophical Society, the highest recognition of scientific labor known to the New World. He was for many years professor in several medical schools, and was President of the Kirtland Society of Natural History, besides filling many other places of honor and trust. His interest in Natural History commenced in his youth, and he was intimately acquainted with the habits of beasts, birds and fishes, and particularly interested in the artificial production of fish. His writings on the various branches of natural history have been frequently published and widely read. He was winning in his manners and benevolent in his disposition. His great age was the result of an active, well-ordered life, devoted to the public good, and he retained his interest in his studies to its close. His name will be cherished as that of one of the most useful men of his time, and his example is worthy of our imitation.

Mr. Wilder then offered the following resolutions in memory of Dr. Kirtland:

Resolved, That the members of the Massachusetts Horticultural Society, in common with the public, have learned with deep and sincere regret of the death of Jared P. Kirtland, LL. D., an old and highly respected Honorary Member of this Society.

Resolved, That though Dr. Kirtland had arrived at an age not commonly allotted to man, we regard his death as a national loss; the loss of one of the most learned and useful men that our country has produced, as a citizen, a man of science, or a scholar. Few have left such enduring memorials of industry, intelligence, and devotion to all that pertains to rural art, rural taste, and human

happiness, as he has left in his writings and teachings. Though he is gone, he still speaks to us in lessons of wisdom, and his works will bless his countrymen while there shall be among them a lover of the beautiful in nature, or a heart to advance the cause of science or the happiness of mankind.

Resolved, That we sympathize with the relatives and friends of Dr. Kirtland in this bereavement, and that as a token of our profound respect for his memory, these proceedings be entered on our records, and a copy thereof be sent to his family.

Charles M. Hovey said that his acquaintance with Dr. Kirtland commenced more than forty years ago, and that, besides receiving from him many communications for the "Magazine of Horticulture," he had kept up an interesting private correspondence with him. His experiments in horticulture showed him to be far in advance of the world generally.

Francis Parkman said that he became acquainted with Dr. Kirtland when he was seventy years old, and that he then appeared in the full vigor of life. He was a man of great energy and enthusiasm, yet these were always tempered with reason. He had a robust mind in a robust body. He was thorough in everything, and his experiments, especially, were exact, for they were conducted by an understanding naturally strong, and improved by careful training. No writer is so complete or so satisfactory in regard to the cultivation of the magnolia; indeed, the discovery of the advantage of grafting the *glauca*, and other species of smaller growth, upon the more robust *acuminata*, is due to him. He was such a man as our country needs, and one of the few whose loss in horticulture may be regarded as a national loss.

The resolutions were unanimously passed.

The President, as Chairman of the Executive Committee, reported a recommendation that the following appropriations be made for the year 1878:

For prizes, ...	$4,575 00
For the Library Committee, for the purchase of magazines and newspapers, binding of books and incidental expenses of the Committee,	225 00
For the Committee on Publication and Discussion, ...	200 00
For a portrait or bust of the President elect,	200 00
For a testimonial to the retiring President, .	150 00

The above appropriations were unanimously voted.

The President also announced the appointment by the Executive Committee, of Edwin W. Buswell as Treasurer of the Society, and Robert Manning as Secretary.

The following vote, presented by William C. Strong, was unanimously passed.

Voted, That the thanks of this Society be presented to our retiring President, Francis Parkman, for the valuable services rendered during his administration, and that as an expression of our appreciation of these services, a committee of three be appointed to procure and present to Mr. Parkman a suitable testimonial.

The Chair appointed as that Committee, W. C. Strong, C. M. Hovey, and Waldo O. Ross.

On motion of Hervey Davis it was

Voted, That the Prospective Prize of sixty dollars, awarded to John B. Moore, for the Moore's Early Grape, be paid out of the unexpended balance of the appropriation for prizes for the year 1877.

W. C. Strong, Chairman of the Committee on Discussions, announced that the Meetings for Discussion would be resumed on the next Saturday, at 11 o'clock, when J. W. Pierce would read a Prize Essay on "Ripening and Marketing Pears," to be followed by a discussion of the subject.

On motion it was voted that when this meeting adjourn it be to Saturday, January 19, at 11 o'clock.

Adjourned.

MEETING FOR DISCUSSION.

SATURDAY, January 12, 1878.

A Meeting for Discussion was holden at 11 o'clock, William C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The following Prize Essay was read by the author, J. W. Pierce, of West Millbury, Mass.:

RIPENING AND MARKETING PEARS.

The pear stands next to the apple in the list of our most valuable domestic fruits, and its cultivation is rapidly increasing, while with many fruit growers there is a disposition to lessen the production

of apples, owing to their uncertainty and tendency to over production in years of plenty. Although the supply of pears has hardly been equal to the demand, and until within a few years they have commanded a high price,—and even now a superior article will bring a very satisfactory reward,—yet I apprehend that, provided we can successfully combat the blight, a few years hence pears will be as plenty and cheap as apples are in ordinary years. I notice that there are more young pear trees commencing to bear, and more pear orchards being planted than there are of apples, and that many orchardists are digging up their apple trees. Certainly *on soils adapted to their growth*, pears are surer and more productive, taken one year with another, than apples, and can be produced cheaper by the barrel.

But while the cultivation of the pear in favored localities is easier than that of apples, the proper ripening and marketing of the pear is attended with more difficulty. Indeed, there are but few people who know how to handle pears so as to ripen them in a way to obtain their best color and flavor, and to bring them to maturity at just the most desirable time; or having satisfactorily ripened them to put them into market in a condition to obtain the best returns. A good pear may be ripened so as to be solid, juicy, and sweet, with a good rich color to its skin, or it may be made corky, insipid, and rotten at the core; or again it may be shrivelled, sour, and unattractive, and these different conditions may all be obtained the same season, and from fruit grown on the same tree. This being the case, the importance of proper ripening will readily be seen. While different varieties may require slightly different treatment, owing to their individual characteristics and the season, yet the same general rules will apply to all. I believe that nearly all pear growers agree that all kinds of pears should be picked while green, and ripened in the house, but at just what time they should be picked, and just how they should be handled to ripen them, are subjects on which there is much diversity of opinion.

But in order that we may intelligently understand this subject, let us see what this ripening process is, and what are the conditions essential to its most perfect development.

Chemists tell us that about fourteen per cent. of the pear is soluble matter, and that it is composed of a trace of free acid, and twenty-three hundredths of one per cent. of albuminoids, and that the rest of the soluble matter is made

up of sugar, starch, cellulose, dextrine, and other farinaceous substances. Now this ripening process is a saccharine fermentation, and is analogous to the malting of brewers' grains. In malting, diastase is formed by a change of albumen in the grain, and this diastase acts as a ferment on the starch, gum, and cellulose of the barley, and changes a portion of these substances to glucose or grape sugar. In the ripening of pears, the vegetable acids which they contain, act on these farinaceous substances, of which the pear is so largely composed, and if the fruit is removed from the trees and kept at a temperature which favors this saccharine fermentation, its cellular tissues will be broken down, its water and aroma set free, and glucose or grape sugar will be formed from its farinaceous substances, giving us a sweet. juicy, high-flavored pear. Now what we want, in ripening pears, is to obtain the most perfect development of this fermentative process, but at the same time to avoid any vinous or destructive fermentation which would destroy the sugar or induce decay. We also want to have the fruit as large and plump as possible, avoiding any wilted or shrivelled appearance, and to obtain its best color—as much of bright straw color, with a tinge of red, as possible. Now how shall we make a practical application of these principles so as to obtain the desired results?

Summer and early fall pears should be picked just before they begin to turn, and when they are nearly grown; should be handled with great care, to avoid bruising, and should be placed in barrels or boxes in a room or cellar, where the temperature may be kept at about 70° and a moderate degree of moisture maintained. A very dry air is not so good, as it absorbs the moisture and aroma from the fruit, injures its flavor, and causes it to wilt and shrivel up. After being kept in such a room a few days they will begin to turn, and some of them will mellow; then they should be sold or used before they soften. The boxes, barrels, or whatever they may be placed in, should be covered with papers to exclude the light and prevent the escape of the aroma.

Care should also be exercised to avoid placing them so deep in barrels or heaps as to allow of the generation of much internal heat, which might carry the fermentation too high and destroy the fruit. When one has the facilities for doing so, he may improve the color, and possibly the flavor, by spreading them on shelves between old newspapers. This ripening between papers, on shelves,

in a room where an even temperature, and the right degree of moisture can be maintained, seems to give the most satisfactory results of any method with which I am acquainted. The manner in which early pears thus treated will color, is truly wonderful.

It is often desirable to lengthen the season of the ripening of some of our early pears; especially is this the case where the Bartlett—which seems to be the standard summer pear for marketing purposes—is the main crop. This may be readily done, by making two or more pickings from each tree, with several weeks between the first and the last picking. The largest and ripest should be picked first—as soon as the windfalls will ripen and be good—and the smaller and greener ones should be left to receive the additional sap which the earlier ones would have appropriated. Sometimes one side of a tree will be much earlier than the other, in which case the earliest side should be picked first.

This early picking should be ripened off at once by the process already described, only observing that the greener the fruit the higher temperature it will require, and a more humid atmosphere will be needed to prevent their shrivelling. Having ripened and disposed of this early crop, another picking should be made and served in a similar way, leaving the greenest on the trees as long as they will keep green. Mulching and, where practicable, watering, will help to prolong their season by keeping up the vigor of the trees. Most summer and fall pears may be kept best by leaving them on the trees as long as they will hang and keep green. I have tried keeping them on ice, but while it checked their ripening, it induced decay and destroyed the life of the pear, if I may be allowed such an expression. Certainly, keeping pears a long time at a low temperature injures their ripening properties. By making early and late pickings as described, we may obtain a larger crop from each tree and sell it at better prices, because we can put part of them into market early, before the bulk of the crop is received, and we can keep a part of the crop until quite late and sell when the rush is over, thereby obtaining better prices. Splendid specimens for exhibition purposes may be obtained by leaving a few of the largest and fairest specimens on the tree and picking all others early; then, when fully grown, pick and ripen between papers or blankets, as the weather and degree of ripeness they have attained on the tree may require.

A great many people pick their pears too green. Such pears

are small, and they will shrivel unless ripened with great care, and they lack the body and flavor of those which are fully grown. Late fall and winter pears should be left on the trees until hard frosts and windy weather cause them to fall; then they should be carefully picked, sorted, and packed in clean barrels and stored where the temperature can be kept as near 40° as possible until the season of ripening has arrived, when they should be placed between woollen blankets in a room where an even temperature of as near 70° as possible can be maintained, and they will soon ripen like summer pears.

I believe the cause of the failure of so many people to satisfactorily ripen winter pears is, that the fruit is kept and ripened at so low a temperature that the tendency to saccharine fermentation is destroyed, instead of being favored, and consequently such pears are dry and tasteless.

The *summa summarum* of this whole matter is, if we wish to keep pears and retard their ripening, we must keep them in a still dry air, at a temperature as near 40° as it is possible. But when it is desirable to ripen them, put them in a dark, warm place with a moderate degree of moisture in the air, and keep them covered to exclude the light and retain the heat and gases which are generated. In warm weather use papers for a covering, and in cold weather use woollen blankets.

MARKETING. To the man who grows pears for profit, the subject of marketing is of paramount importance, but here is where many fail. They can produce first class crops in abundance, but fail to put them into market in the best shape and at just the right time. The best way to market a crop of pears depends very much on the quantity, the kinds, and the distance from market, as well as the individual tastes of the producer.

To one who has a large quantity of fruit to dispose of, and who is located some distance from a large market, or one who has not any taste or ability for marketing, I would recommend to ship them, while yet hard, to some reliable fruit dealer in one of our large markets. By so doing he may obtain his money in a mass and save a large amount of time. Pears sold in this way should be carefully sorted, discarding all ripe or wormy ones, as well as those which are knurly or undersized, and they should be packed in clean barrels, with a layer of choice ones laid on their side in the bottom of the barrel; then fill in a few carefully and shake down;

then more and shake again, and when even full after it is thoroughly shaken, press the head in, drive the hoops, and nail the head in, and line it with pieces of old hoops or green twigs; then turn the barrel over and mark the name of the party to whom it is to be shipped, as well as the kind and quality. If shipped before cold weather, or if nearly ripe, the barrel should have holes bored in it to admit a circulation of air and prevent the fruit from heating and rotting.

Great care should be exercised to use only clean, sweet barrels, and new ones should be used when they can be obtained. Pears will readily absorb odors from the barrel or whatever they may be packed in. Any substance which will absorb moisture, like sugar or salt, will induce decay. The value of a barrel is too insignificant when compared with that of the pears it will hold, to warrant the use of doubtful ones.

When small quantities are to be sold in a local market, it is better to put them out in a nearly ripe condition: that is when they just begin to turn, but before they are soft. When sold in this condition I know of no better way to handle them than to pack in shallow boxes similar to those used by market gardeners for the sale of vegetables. These boxes should be made to hold just a bushel or half a bushel each when even full, and the bottoms, for the sake of ventilation, should be made of battens three-fourths of an inch thick, and one and one-half inches wide, with three-fourths of an inch spaces between them. The bushel adopted by our government contains 2,150.42 cubic inches, and as pears as well as other fruits and vegetables are sold by heaped measure, which amounts to about five pecks even measure, we must add one peck to the standard, which will give 2,688 cubic inches in a heaping bushel. Now a box made eight inches deep and eighteen wide by eighteen and two-thirds long, will hold 2,688 cubic inches even full, and such boxes may be packed into a common market wagon side by side and as high as is desirable, without injury to the fruit. For pears which are quite ripe it would be better to use half-bushel boxes of the same dimensions, except in height, which should be only four inches instead of eight. In a four inch deep box, mellow pears may be safely transported quite a distance in a spring wagon.

Common baskets should by all means be avoided for handling ripe or nearly ripe fruit. They are not rigid enough; they are continually changing their shape, and a slight movement will jam the fruit more or less. Let any one who doubts this take a half-

bushel of pears to market, when they are nearly ripe, in a basket, and failing—as he ought—to sell them, carry them home again and see what they look like the next day. I do not know of any thing to hold fruit for market, that is more objectionable than a common basket. But pears packed in these shallow boxes, with openings in the bottom, may be carried to market, and if not sold can be taken home again without injury. For convenience of handling, these boxes should have holes cut in the opposite sides for handles.

Whether to sell wholesale or retail is a matter for each producer to decide for himself, and must depend very much on his quantity of fruit and distance from market, but it must be borne in mind that retailing takes a great deal of time, and can often be done more cheaply by a second party than by the producer.

Discussion.

On the conclusion of the Essay the Chairman called on Marshall P. Wilder, as the Nestor of pear culture. Mr. Wilder said that the maturity of fruits depends on saccharine fermentation, which is followed by the vinous and acetous fermentations. To prevent these, and preserve the fruit in all its beauty, freshness, and flavor, the temperature must be uniform, and be kept below the point at which fermentation, or the ripening process, commences. It was well said by his friend, Robert Manning, some years ago, that "the ripening of fruit is the completion of the chemical process by which starch is transformed into sugar, and is the first step toward fermentation and decay; whatever promotes fermentation will hasten the ripening; whatever retards fermentation will tend to its preservation."

The conditions of success in preserving and ripening fruit may be briefly stated to be the perfect control of temperature, light, and moisture. Various fruit houses and cellars have been built in this and other countries for this purpose, and all experience shows that these conditions must be complied with or success cannot be attained. Hence these apartments must be cool, and constructed so as at pleasure to exclude the external atmosphere. It is possible, however, to preserve the temperature at so low a degree, and so long, as to destroy, especially with some varieties of the pear, the vitality, and therefore all power ever to resume the ripening process. Experience proves that for the common varieties of the pear

about 40° of Fahrenheit is the temperature best suited to hold the ripening process in equilibrium.

The proper *maturing* of fruit thus preserved demands skill and science. Different varieties require different degrees of moisture and heat, according to the firmness of the skin, the texture of the flesh, and the natural activity of the juices. Thus, some varieties of the pear will ripen at a low temperature and in a comparatively dry atmosphere, while others, like the Easter Beurre, are improved by a warm and humid air. Some varieties of the pear, ripening with difficulty and formerly esteemed only second rate, are now pronounced of excellent quality, because the art of maturing them is better understood.

Mr. Wilder said that these remarks, like his own experience, had special reference to the apple and pear, though the principles laid down were doubtless susceptible of more extensive application. Fruits designed to be kept for a considerable time should be gathered with great care some days before the ripening process commences, especially summer pears. A summer pear ripened on the tree is generally inferior. In respect to these, Mr. Barry, when editor of the "Horticulturist," so aptly expressed the views of the speaker that he used his language: "The process of ripening on the tree, which is the natural one, seems to act upon the fruit for the benefit of the seed, as it tends to the formation of woody fibre and farina. When the fruit is removed from the tree at the very commencement of ripening, and placed in a still atmosphere, the natural process seems to be counteracted, and sugar and juice are elaborated instead of fibre and farina. Thus, pears which become mealy and rot at the core, when left on the tree to ripen, become juicy, melting, and delicious, when ripened in the house."

O. B. Hadwen thought that pears required much skill in ripening, and that but few varieties should be kept in the house at a time. With pears, as with grapes, the best results are obtained by those who give special attention to their ripening. The further he went in pear culture, the more he was convinced that to grow pears profitably not more than three or four varieties should be cultivated.

Robert Manning spoke of the opinion entertained by the late John Gordon, an extensive pear grower, that the color of pears was brought out better when they were covered with woollen cloths than when any other material was used. He had seen similar views expressed in print by others, and was led to suspect that the wool-

len cloths might possibly produce some specific effect in heightening the color of the fruit. He inquired Mr. Pierce's views on this point.

Mr. Pierce had not observed any special effect on the color from the use of woollen cloths. He had used them only in cold weather to keep the fruit warm.

Robert Murray had generally been successful in keeping pears, but this year they had not kept so well as usual. He put them in boxes and kept them in a cool place, and brought them into a warmer room to ripen them. The Winter Nelis was very fine, and ripened earlier than usual, though they shrivelled. The Sieulle dropped its leaves, yet the fruit ripened. In previous seasons he had kept the Beurre d'Anjou until March, but this year, with the same care, they were all gone two months before that time. He did not understand the cause of this difference in their ripening. He placed Lawrence pears in a box in a cold shop, and covered them loosely, and though they must have been frozen, in January every one of them was perfect.

Mr. Wilder said that his pears kept better this season than usual, though some, left out-doors in heaps for a time, shrivelled.

Mr. Murray said that he gathered his pears towards the close of October; last fall they remained on the trees longer than usual. He allowed no air to strike the fruit after it was gathered.

Aaron Davis Capen said that after planting his trees he did not force them, for he believed that some growers were forcing their trees too much, and he thought that his had done better than with excessive culture. He had a neighbor who cultivated to such an extent that the fruit was worthless. He was glad to hear Mr. Murray speak of his failures, for he had failed himself, but only through negligence. He had commonly left his pears out late—until the snow came; but this year he put them into the cellar earlier, where they were more exposed to air and warmth, and consequently decayed earlier. At a meeting of the Norfolk Agricultural Society held the last week in March, about eight years ago, he exhibited Passe Colmars in good preservation. He had kept Beurre d'Aremberg and Winter Nelis to the end of March, but this year the Winter Nelis were all gone the first of January. He had had very handsome specimens of Vicar of Winkfield, which he kept in the cellar, until they were wanted for market, when they were placed near a stove in a warm room and colored beautifully.

Mr. Wilder said that to ripen pears it is only necessary to bring them into a higher temperature—50° and upwards—and keep them from the light.

The Chairman asked whether better quality could not be obtained by special methods with some varieties, the Vicar of Winkfield for instance.

Mr. Wilder answered the Chairman's question in the affirmative.

Mr. Murray had never thought much of the Vicar, but this year he had some fine specimens, which were brought into the cellar near the furnace to ripen, and colored up beautifully, so as to look very tempting, but they were worthless for eating.

Alexander Dickinson had found that when proper care is given to it the Vicar is a nice pear. They are finer on quince stocks than on pear roots, but are apt to over bear on the quince, and must be thinned. If rightly handled they are one of the best pears — he thought more of them now than ever before; when well ripened up they are nearly equal to Beurre d'Anjou.

Mr. Murray said that he had one tree and that was all he wanted. He considered it the most worthless of all pears.

Mr. Dickinson said that he kept them in a stable where it was cool and shady, and never picked them over until they were sold. When well ripened they look very much like Bartletts.

Mr. Wilder said that A. J. Downing once asked him what pear he would plant if he were restricted to one variety, and he replied "the Vicar." The Massachusetts Agricultural Club, after five years' discussion agreed on eighteen pears as most desirable for cultivation, and the Vicar was one. Messrs. Walker, Cabot, and Lovett, who were experienced pomologists, differed at first, but finally agreed. Mr. Wilder said the Vicar is sometimes all but first rate. It has more aroma than any other pear, and has sold for from two dollars and a half to three dollars per dozen; but this, it must be remembered, was a long time ago.

E. W. Wood said that five years ago the Newton Horticultural Society recommended twenty varieties of pears, of which the Vicar was one, but there was a strong opposition to including it, and he then quoted the opinion expressed by Samuel Walker and just referred to by Mr. Wilder. But the speaker said he had never been able to grow it of good quality; the trees, especially dwarfs, set a great crop, but his never matured so as to make a first class table pear. In January, 1874, Mr. Dickinson took the first prize for

winter pears, one of his varieties being the Vicar, and, in the accompanying statement, said that they had been kept in his barn covered with hay.

Mr. Dickinson said that this year he had kept them in boxes; he had never had another opportunity to keep them in hay.

Mr. Wood spoke of a gentleman in Quincy who asked fifteen dollars per barrel for his Vicars [Mr. Wilder said that he had sometimes got twenty dollars for his], and who meant to set out five hundred trees next year, but partly for stocks, as it is the best of all growers. It will grow like the Baldwin apple. He had had trees on the quince root make good pear roots in four years.

Mr. Pierce said that he would leave pears on the tree as long as he could safely.

Mr. Dickinson remarked that the Vicar should be planted on a warm gravelly loam, in a sunny place. It will not produce good fruit on a clay soil.

Mr. Capen formerly had a neighbor who thought the Vicar not fit to eat, but before he died he acknowledged its excellence. He had, himself, two trees, one of which never produced a good pear, and the difference could not have been caused by the soil.

Mr. Wilder said that his friend Dr. Burnett, while travelling in the West the present winter found Vicars selling for a shilling each, and as good as any pear. They were of California growth.

Fred W. Kelsey thought the whole truth in regard to the Vicar could be summed up in a few words—if well grown they are magnificent; if poorly grown they are worthless. The top of the tree should be kept open and thin to admit the sun and air.

Mr. Manning thought the soil a very important point. He agreed with Mr. Dickinson that good Vicars could not be produced on a cold, damp, or clayey soil; but on a warm soil, well exposed to the sun, they acquire a red cheek, and will "yellow up" well and be of fair quality.

John B. Moore said they would not always produce fruit of good quality on warm soils. He had plenty of sand and gravel, and had thinned the fruit and grown it large, and then had to sell them for one dollar per bushel. He preferred a first rate pear; the Vicar is simply a cooking pear. Mr. Dickinson would not say it is as good as Beurre d'Anjou or Winter Nelis. The speaker had had crops of forty or fifty bushels, and the quicker he sold them the more money he got. He meant to graft his trees with other varieties.

Samuel Hartwell had been unfortunate in ripening his Vicars until this year. He gathered the crop on the 10th of November, kept them in a cool room for about a month, and then carried them into a cool, dry cellar, and though they are now all gone, they were all eaten and were very nice.

N. B. White said that if no other pear could be grown he would plant Vicars. His soil was cold and he sold his Vicars for two dollars and a half per barrel. Thinning will make a difference, but people generally will not take the trouble to do it.

C. M. Hovey said that all the gentleman who had spoken were correct. Years ago, when we had not so many good pears as we have now, the Vicar was valuable, but now they are not worth carrying to market. California specimens have been sold for three dollars per bushel. He had Vicars as good this year as they ever were, but they will not compare with other winter pears, and can now be considered as scarcely worth growing.

Mr. Dickinson said that Mr. Hovey's soil had a clay bottom, and he did not think you could raise a good Vicar on it. The trees must be well manured and kept in a good growing state. If allowed to grow too thick there will be black spots on the fruit, which is very objectionable. He sold his this year for three dollars per bushel, which is about as much as he could get for anything.

The Chairman remarked that Mr. Hovey and Mr. Dickinson had run neck and neck in exhibiting pears for premium.

Mr. Wilder said that all the different opinions which had been expressed were honest. Mr. Dickinson's Vicars must have been better than Mr. Moore's. We do not say that it will succeed well everywhere.

Mr. Murray said that his trees grow on a warm, gravelly soil, and four years ago he had a bushel of fine ones, which about the middle of February he sold for four dollars; but the buyer afterwards told him he could not sell him any more of that rubbish.

Benjamin G. Smith did not consider it the best pear, but one of the best. His finest specimens were sent to the table and the others were used for cooking.

Mr. Hovey alluded to the fruit house built in Cambridge, on Professor Nyce's plan, some years ago, and said that he had never put any pears into it but once, as he had found that pears in winter are of no great value as a market product. Fruit kept well there, however, and Seckels were quite plentiful in our market and of good

quality as late as January, supplying the demand so that the Dana's Hovey would not command much more than half the ordinary price. So far as respects keeping pears the process is successful, but the value doubtful.

Mr. Dickinson said that the fruit house pays, and is a good thing if managed properly. Some kinds do better in it than others; among these are the Bartlett and Beurre d'Anjou. Beurre Bosc and Duchesse d'Angouleme will not do. Bartletts sold for five and six dollars per bushel, but they lose their flavor after a time. As much or more fruit is put into the fruit house as ever, but it is not managed on Prof. Nyce's system.

The Chairman announced that next Saturday William D. Philbrick would read a Prize Essay on "Bottom Heat."

BUSINESS MEETING.

SATURDAY, January 19, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, President Gray in the chair.

The following vote was unanimously passed:

Voted, That the vote passed November 3d, 1877, concerning the Treasurer's Report, be repealed.

E. W. Buswell read his Annual Report as Treasurer, including the Report of the Finance Committee.

The following vote, offered by John C. Hovey, and seconded by Francis Parkman, was unanimously passed:

Voted, That the Secretary of this Society is hereby directed to keep a complete record of all awards made by the Committees on Fruits, Flowers, and Vegetables, in a book or books kept for that purpose; and that the Chairman of each Committee named is directed to furnish the Secretary with a copy of all awards immediately after each exhibition.

W. C. Strong, Chairman of the Committee on Publication and Discussion, presented the list of Prizes for Essays for the year 1878, which was read by the President.

Adjourned to Saturday, February 2.

MEETING FOR DISCUSSION.

The following Essay, for which a prize had been awarded, was read by the writer, William D. Philbrick, of Newton Centre, Mass.:

Bottom Heat—Its Benefits and Methods.

By the term "bottom heat," as used by gardeners, is described the application of artificial heat, of whatever kind, to the soil in which plants are grown, or in which seeds or cuttings are started into growth under glass, in the autumn, winter, or spring. It is called bottom heat to distinguish it from the heat of the air over the soil, which is maintained, in general, at a lower temperature than that of the soil. The temperature of the air is subject to considerable variation, incident to the effect of sunlight or of cold winds upon the glass, while bottom heat, or the heat of the soil, should be kept more uniform.

It is very difficult, during the severe weather of our winter and early spring, to start into growth tender and tropical seeds and cuttings, without the application of bottom heat. The earth must be maintained for weeks together at a temperature never less than 60°, even during the long, windy nights, when the thermometer outside may indicate several degrees below zero. If heat is applied by artificial methods only to the air over the bed, it is not found so easy to prevent the bed from becoming chilled by the cold earth underneath, which at this season of the year has a temperature of not far from 40°.

The benefits to be derived from the use of bottom heat, are limited almost wholly to the kinds of work mentioned above, and will be found to be less and less apparent in proportion to the hardiness of the plants or seeds with which we have to deal, and to be less and less needed as the warm weather advances.

Thus the gardener finds bottom heat essential in starting the seeds of early tomatoes, peppers, egg plants, cucumbers, and melons, and in rooting cuttings of coleus, fuchsia, heliotrope, verbena, and other tender plants in early spring; while the hardier lettuce and radish seeds, and cuttings of geraniums will grow more healthily without bottom heat as soon as the severe weather is past. Cuttings of all kinds are rooted in cool weather much more rapidly by means of it than is possible in any other manner.

This is because we wish to stimulate a growth of roots, before the growth of leaves, and to do this we need to keep the soil at ten or fifteen degrees higher temperature than the air over the bed. This relation of temperature of the air to that of the bed is not difficult to maintain in the cool weather of winter and early spring, and as this is the season when we wish to multiply our stock of bedding and other plants for spring planting, it is at this season that the gardener finds most use for his cutting bench. When the temperature is kept uniformly at the right point, the rapidity and certainty with which the cuttings root is astonishing. The soft wooded plants will root in about six days and the harder ones in ten or twelve, with a very small percentage of failures.

In order to prevent fluctuations in the temperature of the air by the bright sunlight in fine days in spring, it is usual to construct the cutting bench upon the northern side of the greenhouse, with a partition or shade to cut off the direct light of the sun, which would defeat our purpose by wilting the tops of the cuttings before they are rooted; such precautions in avoiding the sunlight are not needed, however, in starting seeds, as young seedling plants have roots enough to endure the heat, if well watered and aired.

Wherever bottom heat is used the evaporation from the surface of the bed is rapid, and frequent watering is necessary, especially in clear and windy weather. This should be attended to at least once a day.

When plants are hardy, or well established in their roots, and when the temperature of the bed in which the roots grow, and the air above it, are easily kept at a proper temperature for the requirements of the plants to be grown, there will be no advantage gained by bottom heat; but on the contrary it will be found to foster a tender, rapid growth, and the bed will need so much care as regards watering and regulating the temperature, that it is best to do without it whenever practicable.

The methods in use for obtaining and applying bottom heat, may be conveniently divided into two classes, depending upon the source of heat, whether from fermenting animal and vegetable refuse, or from fire.

Where fermenting material is chosen it is most common to make use of horse dung, either alone, or mixed with forest leaves, refuse hops from the brewery, or tan bark from the tan yard. Horse dung, fresh from the stable, is the best material known, and where

obtainable in sufficient quantity is generally used in preference to any other material; when it is very strawy it will be improved for heating purposes by an admixture of nearly an equal bulk of wet forest leaves, or of waste hops fresh from the brewery; but when the straw litter is not in excess, the manure just as it comes from the stable is in the best order for a hot-bed. It should be carted from the stable before it has had time to become heated to excess, and piled in a heap of several cords upon the farm, and when the fermentation has fairly commenced, but has not continued over two days, the manure will be in prime order for use.

As manure heat is almost exclusively used for working hot-beds, the method adopted by the best gardeners deserves description.

The bed is prepared in the fall, in a sheltered and well drained situation. The south or southeast side of a high fence is the best place; the land is prepared by enriching with manure and repeated plowing to work it fine. In November the planks are put down, the back plank being placed three feet from the fence. It should be twelve inches wide, and the front one ten inches wide; the distance between the planks should be six feet, outside measure, so as to be covered by three by six feet sashes. The front plank should be five inches lower at its upper edge than the rear plank, so as to give five inches pitch to the glass; the planks should be nearly level as to the length of the bed, as, when one end is higher than the other, the high end always works warmer than the other. The planks are held in place by stakes made of pickets four inches wide and one inch thick, sharpened, and driven into the ground by the help of an iron bar and maul, and nailed to the outside of the planks with tenpenny nails. The planks will need to be braced apart at intervals of one or two rods to keep them at the proper distance asunder, so that the sashes may fit closely.

The bed thus prepared is covered over with leaves, eel-grass, or other coarse litter to a sufficient depth to keep out frost; it can be uncovered and put in use at any time during the winter when needed.

It must be prepared a few days before wanted for use in order to get the manure working well and the bed warm. The preparation is done thus: the loam is excavated for six feet in length at one end of the bed until the pit is twenty to thirty inches deep below the top of the planks, the depth being regulated by the depth of manure and loam required, which varies with the severity of the

season and the nature of the plants for which the bed is intended. The loam taken from the first six feet in length of the bed is to be carted to the other end to be used in covering the manure on the last six feet. Hot manure from the heap should now be carted into the pit and carefully spread and tramped down; the depth required will vary from six or eight inches in spring to ten or twelve inches in winter. The loam from the next six feet in the length of the bed should be immediately thrown on to the hot manure, and sashes placed over it, and the excavation thus made filled with manure as before, and the process repeated until the bed is completed. The depth of loam thrown over the manure will vary with the work required, hardy plants, such as lettuce and radishes, requiring eight or ten inches for thrifty growth; while the depth needed for tomatoes, cucumbers, and other tender plants will be only six inches; the less the depth of loam used the more the heat of the manure is felt by the plants, and the more care will be required to water sufficiently often.

Where a considerable depth of manure is used with a light covering of loam, in preparing for tropical plants, the heat for the first few days is apt to be excessive, and care will be needed in airing the bed both day and night, to prevent destruction of the plants; the excess of heat generally passes off after the first week.

A well made hot-bed will retain considerable heat for six or eight weeks from the time it is started. The heat gradually subsides from the time of beginning, and this is not objectionable in the spring, when the weather is constantly growing warmer, and the bottom heat is less and less needed.

In the severe weather of winter, however, the hot-bed is rather difficult to manage, and unless fully twelve inches of manure is used the heat will sometimes become exhausted before warm weather comes and cause trouble. In fact a great deal of skill and care is required to run hot-beds sucessfully in winter.

When a constant temperature of 60° to 70° degrees of bottom heat is required in a greenhouse for a considerable time, the use of fire heat will be found much more convenient and satisfactory.

The smoke flue is the simplest form of heating apparatus, but is open to objection from the high temperature of the parts near the fire as compared with the more remote parts, and where large greenhouses are required, the heating is done much more satisfactorily by hot water pipes. Another objection to the flue is the risk of fire from the hot brickwork near the furnace.

Where bottom heat is to be obtained by fire it will be needful to box the flue or heating pipes, and the bed of earth or sand over the boxing is best supported by slate stones, which are both durable and good conductors of heat. The boxing should be provided with ventilators to be left open in severe weather when there is risk of freezing the house.

When it is desired to root a few tender cuttings, or to start tropical seeds in a greenhouse which is kept cool for the healthy growth of hardy plants, it can be easily accomplished by parting off a portion of the house with curtains of cotton cloth, so as to avoid airing the warm bed too freely when the rest of the house requires air. The bed can be kept warm readily by placing under it eight inches of hot manure as described for a hot-bed.

This plan is often pursued by those gardeners who raise lettuce and cucumbers in greenhouses; it is desirable to start the cucumber seed while the lettuce is growing, so as to have good cucumber plants by the time the lettuce is cleared away; the different habits of the lettuce and cucumber, one of which is impatient of heat, and the other of cold, render it difficult to accomplish the feat of making them thrive together without some such contrivance as that described above.

Bottom heat is not recommended for forcing lettuce in greenhouses as was the practice some years ago, experience having proved that it grows better without it.

Discussion.

F. L. Harris said that all gardeners are advocates of bottom heat, but that we lose a great deal by using cold water for watering. He would have the water twenty degrees warmer than the atmosphere. Instead of using it at 38° or 40°, the usual temperature of cisterns, he would have it from 70° to 80°. Mr. Harris pointed to a remarkably fine plant of *Cœlogyne cristata* exhibited by him, and said that he would on no account use water of the temperature of an ordinary cistern to water it. He regarded this point as of the highest importance.

John C. Hovey thought every cultivator should understand the rule that in watering any plant the water should be of the temperature of the natural habitat of that plant.

Mr. Philbrick said that the point is well understood by gardeners.

He draws water from the heating pipes, choosing a time when the temperature is from fifteen to twenty degrees above that of the atmosphere. He had known beds worth hundreds of dollars spoiled by the use of cold water.

H. Weld Fuller spoke of a simple apparatus which he uses in the greenhouse at Woodlawn Cemetery to take the chill from the water in an elevated cistern. It consists of a coil of annealed copper pipe, placed around the smoke funnel of a Hitchings boiler, outside and at its base, there connecting with a half-inch lead pipe which leads down from the bottom of the tank, while the upper end of the coil is connected with a lead pipe extending into the higher portion of the water in the tank, and there by a movable coupling, carrying the heated water to a float with a downward finger-vent which is always under the surface and rises and falls with the water in the cistern to keep up the greatest circulation, the principle being the same as that which keeps up the hot water circulation in our kitchen ranges. In this case, nine coils of half-inch pipe, rising slightly at each turn, accomplished the heating perfectly, the whole costing less than eight dollars.

James Cruickshanks corroborated what Mr. Harris had said. He had been astonished where water was drawn directly from a faucet, that plants should succeed as well as they do. He recommended a tank of soapstone, in which the water will, in twelve hours, acquire the temperature of the house.

W. C. Strong said that while all would agree to the principle laid down by Mr. Harris, there is a limit to its application. He had visited a successful cultivator of roses, who cut a full crop at Christmas and Easter, from plants the roots of which were in the outside ground where they got all the rain. The case is the same also with forced grapes. He believed that many plants are not as sensitive as might be inferred from what had been said, but have sufficient constitution to endure showering with cool water and are refreshed by it. He did not include among these, however, the delicate plants cultivated by Mr. Harris, but the majority of plants generally cultivated, for which he thought warm water unnecessary.

Mr. Hovey asked if the borders for forced grape vines were not generally covered, and referred to the production of three crops in two years by M. H. Simpson, who covered his borders thickly with wool waste, over which boards were placed to shed the rain. The covering was put on in July, when the temperature of the soil was highest.

Mr. Strong said that with the temperature of soil at about 42°, grapes could be forced without covering the border. He had ripened a ton in May, with only a covering of manure. We can stimulate the growth of plants by using warm water.

Marshall P. Wilder was gratified with the remarks of the last speaker. He had. himself, no roses in his greenhouse, except those planted on the outside, and as he covered the border only a few inches in depth it must frequently be frozen, and a portion of the roots must be frozen. The old rule was that water should be kept in tanks until it acquired the temperature of the atmosphere before watering, and he disapproved of pumping up cold water and immediately using it indiscriminately on all plants. He was pleased with the remarks of the essayist in regard to flues; he had used no other method of heating his cutting beds, except experimentally.

N. B. White asked, Will plants thrive in frozen earth? Are they not conductors of heat, and do they not thaw the soil? It seemed impossible to him that a plant could grow in frozen soil.

M. H. Merriam came in feeling much interest in the subject of the discussion, and wanting to know the principles which govern the application of bottom heat; but while the essayist and others had given us many interesting facts, they had not given us the principles which underlie those facts, and which the speaker thought highly important that we should understand. The ripened wood of roses is not treated the same as soft wood, and what we lack is a knowledge of the philosophy which controls propagation by cuttings of different degrees of maturity, and accounts for this difference in treatment. If the novice attempts to learn from books, he will find that they disagree; some say that the temperature of water is of little consequence, while others consider it of great importance. The speaker believed in the individuality of every plant. The conditions under which a plant grows naturally are to be considered. Nature propagates mainly through seed, while propagation by cuttings is an artificial method, and we must inquire into the conditions under which it is best effected, and apply our best resources to bring about these conditions. He had had experience as an amateur in propagation by cuttings, and had been flatteringly successful. His propagating bed was on a bench with hot water pipes underneath, closely enclosed; the bed was also enclosed above, and had ventilators to control the admission of air above and below. Out of one thousand cuttings of Bon Silene rose he

had potted seven hundred, and had rooted five hundred carnations with no failures to speak of.

Mr. Philbrick thought that the last speaker might fairly claim to understand the theory of propagating by cuttings, and the use of bottom heat. For tender seeds, such as cucumbers, the earth should be kept at a temperature of about 70°; for lettuce at about 50°, and for radishes at a little less. A cutting is a plant in an unmatured state, and we want to stimulate the production of roots before leaves; after that is effected it will grow anywhere. If the leaves are not removed when the cutting is made, the plants will go before you know it.

Mr. Merriam understood that the object of bottom heat was to furnish a stimulus to the cutting; but the question is, how much to each plant, and to the same plant or cutting in different conditions of maturity, for it will require different treatment under different circumstances, *i. e.*, of maturity. Ripened wood, it is generally thought, will not bear as much bottom heat as soft wood. For green cuttings of roses a bottom heat of 50°, and overhead 45°, is right.

Mr. Strong, as Chairman of the Committee on Discussion, announced that next week Mr. Philbrick would read a paper on "Irrigation."

MEETING FOR DISCUSSION.

SATURDAY, January 26, 1878.

A meeting for discussion was holden at 11 o'clock, President Gray in the chair.

The following essay, for which a gratuity was awarded by the Committee, was read by the author, William D. Philbrick:

GARDEN IRRIGATION—ITS ADVANTAGES AND LIMITS.

The watering of gardens has been practised from the most ancient times of which we have any authentic record, to the present day; in fact, the beginning of irrigation dates back much earlier than authentic history. It was practised by the ancient Egyptians long before Herodotus described their wonderful water-works, and Damascus, the oldest city of the world, owes the very existence of

its gardens and the subsistence of its population to the practice of irrigation. In this country, too, the first Spanish invaders of Mexico and Peru found a very elaborate system of aqueducts in use by the Aztecs, which has since fallen into decay in consequence of the neglect of the miserably indolent people who have now possession of those countries.

It is not, however, the purpose of this paper to discuss the interesting history of irrigation, or to show, as might be done, that its practice is one of the best signs of enlightened industry and civilization; but to call attention to some of the practical questions connected with it in New England today.

These questions naturally present themselves in the following order, viz.:

1st. The amount of water required for successful irrigation.

2d. The sources of supply.

3d. The means of application, and of distribution of the water over the land.

4th. The advantages and limits of irrigation.

1st. *The Amount of Water Required.* The amount of water needed by vegetation during the growing season, for a full crop of most kinds of useful or ornamental garden products, is variously estimated by different authorities; the requirements themselves are very different under different circumstances; a loose, sandy soil will require much more water to irrigate it than a retentive clay or a peaty intervale; and some kinds of vegetables, like celery and cauliflowers, require much water; while many others, like corn, beans, and the grains, will endure considerable drought without injury. Much also depends on the temperature of the air, and the velocity of the wind, as well as on the more evident and important considerations of rainfall and atmospheric humidity.

In general, however, it may be assumed that, in the warm, growing months of May, June, July, August, and September, most vegetation requires an inch in depth over the entire surface of the land every five days. This is, of course, only an *average* amount; sometimes less than half this amount will be needed, and sometimes much more.

This amount, estimated as needed by our gardens, would be equivalent to six inches per month of rainfall; if we compare this amount with the actual rainfall, we shall arrive at an idea of what is to be supplied artificially.

The rainfall at Boston, as observed by the Superintendent of Sewers, for the past six years, for the five growing months above named, varies from a maximum of 10½ inches in the month of August, 1872, to a minimum of 0.65 inch in June, 1873. During these six years there was not a single year when we did not suffer more or less from drought during some portion of the summer. Twenty-one of the thirty months in question had less rainfall than six inches per month, and the average of these twenty-one months was but 3.02 inches per month, or only about half what was needed for a full crop of garden products. Some of the protracted seasons of drought were almost entirely rainless for six weeks, during which the weather was excessively hot and windy, and vegetation suffered extremely in consequence.

2d. *The Sources of Supply.* Many gardens are so situated as to be able to draw upon the public water-works for a supply. The gardeners of Arlington and Winchester, and many other towns, have found this a very convenient and profitable method of watering their gardens, and in general where the water rates are not excessively high, and where the gardener has not at hand a cheap, natural source of water, the public works will be found both convenient and reliable. There are, however, many farms and gardens beyond the reach of the public water-works, where private works might profitably be erected for irrigation. As above noticed, however, the amount of water required for any satisfactory result is very large, and before embarking in any enterprise of this kind, it would be best to make sure that the source can be depended upon for a sufficient supply *in the driest seasons;* for it is precisely at such times that most water is needed.

Springs and wells are entirely inadequate to furnish water for anything more than a small patch of garden. The only sources to be depended upon for any considerable amount of irrigation, will be found in rivers, lakes, and ponds. There are few gardens so favorably situated that the water can be drawn by canals or ditches directly from some pond or stream to irrigate the surface. Where this can be done, it is by far the cheapest method, and it is in this way that the extensive irrigating works of Lombardy, Spain, France, California, and Colorado are constructed.

Where this system is adopted, considerable expense will be required to grade the land into beds or levels, so as to distribute the water easily and evenly; but once done, the water is afterwards

applied at a very trifling cost, — so cheaply that it is used for all farm crops in Lombardy and the south of France.

In most gardens, however, the supply of water, if any can be found within reach, will be at a level too low to reach the land without pumping, and a few suggestions will here be in order as to the best methods of pumping, which brings us to the next division of the subject.

3d. *The Means of Application and Distribution over the Land.* It will be seen at once by any practical person that it would be futile to think of distributing 27,000 gallons of water, or 108 tons to every acre, by means of watering carts. Not only would much time be required, but the land would be badly beaten down by the cart wheels, which would also injure the growing crops. To distribute the water by tiles, laid a foot below the surface, to escape the plow, would be ineffectual, only wetting the subsoil and wasting much water, which would soak into the subsoil or drains.

The only method of distributing water much used in gardens where pumping is practised, is the system of iron pipes laid underground, with hydrants distant two hundred feet asunder, from which the water is distributed by one hundred feet of india rubber hose. This is also the plan adopted by the gardeners who make use of the public water supply.

In this method of applying the water, it is not necessary to grade the land with reference to running the water in nearly level ditches, as must be done where the open ditch system is used. Where the land is undulating, as is mostly the case with our garden land, it will be desirable to carry the lines of pipe along the high ridges and headlands as much as possible, so as to enable the gardener to let the water run down the grade of the land between the rows of the crops to be watered. This will be found more expeditious and less laborious than carrying the hose down the rows and sprinkling the whole surface from the nozzle of the hose; the latter method, however, is sometimes used where the land is very uneven, and where furrows for running the water cannot conveniently be made between the thickly planted rows of garden crops.

Where the water has to be pumped and distributed by hose and sprinkler, it will be found good economy to use a powerful pump, that will give a head of at least thirty feet, and to use for distribution, pipes of not less than one and a half inches diameter, provided, of course, that any considerable area — an acre or more — is to

be watered. Thus, for example, we will suppose that it is required to water five acres of land, and that we have near by a never-failing pond or river; we can locate a steam pump near the river, and while at work watering we load the safety valve upon the delivering water pipe at fifteen pounds per square inch, which corresponds to a head of about thirty feet of water. We have three hundred feet of iron pipe, two inches in diameter, and one hundred feet of india rubber hose, one and a half inches in diameter, for delivery of the water; this apparatus would be capable of delivering forty-five gallons per minute, or twenty-seven thousand gallons per day of ten hours; enough for the thorough wetting of one acre per day, or every acre of the five once in five days; by running nights, ten acres could be watered with this apparatus.

Where it is only desirable to water a limited area of land—less than an acre—the windmill furnishes a cheaper source of power than the steam pump. To make it available, however, large storage of water must be provided at a high level, so as to admit of keeping the mill at work during stormy weather and storing the water until needed. A windmill for pumping, costing, with pump and tank, about $500, will furnish water enough for the irrigation of one or two acres of land, provided storage can be supplied at a high level for 200,000 gallons of water. To provide this storage might cost as much as to provide steam pumps; and any decision with regard to details of this kind, would depend upon the varying circumstances of each particular case. It is only proper here to call attention to the fact that where elevated reservoirs can be easily made, and the amount of water needed is not over 10,000 gallons daily, the windmill is, without doubt, cheaper power than steam; when the amount of work to be done is much larger, steam is in general to be preferred.

4th. *The Advantages and Limits of Garden Irrigation.* This question resolves itself into the practical one of whether it will pay to irrigate gardens; of course gentlemen who have almost unlimited funds to spend upon their pleasure grounds, understand the advantages of irrigation as a garden luxury, and will have water at any cost; it is here proposed only to consider briefly how far a practical gardener, who makes gardening his source of living, can afford to irrigate. This will depend first on the cost of water.

Water is supplied by the public works in some of our cities at 25 cents per thousand gallons. This is a rather high rate; at this

price it would cost to apply 27,000 gallons to an acre $6.75 for the water and about $3 for the labor,—say $10 per acre for each watering; and as each acre would generally need at least ten or twelve such waterings in a season, water applied in this way in sufficient quantity would cost from $100 to $125 per acre. There are some crops raised upon our market gardens which would warrant an outlay like this, but they are few. Early cucumbers, lettuce, celery, and cauliflowers may be mentioned as examples. These crops frequently sell for $1,000 per acre, and are sure to sell at the highest prices in time of drought, so that it is safe to say that where water is to be had at this price, the gardener would be warranted in applying it to his hot-beds and greenhouses, and to his most valuable field crops, in time of drought. This, however, is a high price to pay for water. It could be pumped and distributed by windmills or by steam pumps at about half this cost in very many favored locations, and then the use of it would be extended to crops of less value. The application of water to gardens has not, however, been practised in this neighborhood long enough to enable one to estimate very accurately where it would pay and where it would not; but it is well worth careful study by those who raise valuable crops of vegetables and small fruits.

Those lands which are naturally so situated as to be commanded by a good natural supply of water at such level as to be easily applied by a system of canals and ditches, are rarely to be found in those highly cultivated regions where gardening is practised; the cost of water under such circumstances is reduced to a minimum, and by grading the land for the purpose of distribution without pipes, the yearly cost for water has been reduced, in some cases, as low as from one dollar to three dollars per acre per year. Under such circumstances and in the dry climates of many parts of the world, irrigation is universally applicable, and even essential, to the growth of grass, grain, and all kinds of vegetables. This is, however, not garden irrigation and can receive here only passing notice.

A very important consideration, wherever irrigation is practised, is the drainage of the land. Wherever this is not naturally perfect, it must be made so artificially before irrigation can be safely practised, otherwise if a heavy fall of rain should occur just after an artificial application of water the crops might suffer seriously from being too wet.

Discussion.

Benjamin P. Ware said that the subject of the essay was one of great interest to him. He tried an experiment in irrigation last summer, which though not successful in every respect, was instructive, as even failures are. He has on the sea-shore a large house for summer boarders, accommodating from one hundred to one hundred and twenty-five persons, and the question of the disposal of the sewage is a serious one, both from a sanitary and an agricultural point of view. He built a cesspool three feet deep, four feet wide, and five or six feet long, into which all the waste water from the kitchen, chambers, and laundry was discharged by a cement pipe of the Bloomingdale pattern. From this a three inch pipe led to the vegetable garden, running along the side of the garden, and opening into lines of drain tiles laid across the garden at intervals of ten feet. It was presumed that through the joints between the tiles the sewage would moisten the soil above, and it was hoped to ascertain the value of sewage as a fertilizer. The apparatus worked very well; if at any opening the flow was too great it was checked by placing a piece of tin over it. The crop was a variety of family vegetables, but Mr. Ware did not find their growth any better along the lines of tiles than elsewhere, and was led to question the value of sewage. The impurities were mostly absorbed by the soil. In the course of the season a large quantity of grease was deposited from the sewage, the cesspool being nearly filled, and the openings in the drain tiles where the water soaked out also became choked with grease. He proposed to take up the drain tiles and continue the pipe to a slope of grass ground, and let the sewage flow upon the surface. He had great hopes that in this way it would prove beneficial.

Mr. Ware described a method, which he had practised, of making a pipe, for conducting water or sewage, very cheaply. He provides a pole ten feet long, three and a half inches in diameter at one end and three inches at the other. The material of the pipe is one part cement, and two parts coarse sand or fine gravel. After digging a trench to the required depth, cement is placed in the bottom to the length of the pole, and on this the pole is laid and covered two inches thick with the cement; in from five to eight minutes the pole should be twisted round, and a few minutes later, after the cement has set, it should be withdrawn, and another length of pipe made. With good cement it takes fifteen or twenty minutes

to make one length, and two men can lay one hundred and fifty feet or more a day, at a cost of three dollars. One of these pipes laid twenty-five years ago is now a solid stone.

Mr. Philbrick inquired whether Mr. Ware's vegetable garden was well drained.

Mr. Ware replied that it was not drained artificially, but the soil was of such a character as not to require it.

Marshall P. Wilder said that he had been extremely interested in what Mr. Ware had said, and spoke of the method of irrigation in use at Salt Lake City by open channels, into which the water is admitted, or from which it is stopped, by a shingle. The effect of water on the surface is different from that of water under the surface. Air and water are the two great promoters of vegetation. The grease which accumulates from sewage is an absolute injury to vegetation.

C. M. Atkinson was doubtful of the advantages, for drainage, of the pipe described by Mr. Ware, porosity and joints being needed in drain pipe, but it would make an excellent conductor. He had put down five hundred miles of drain pipes, and this winter had a piece of retentive soil to drain, in which he dug trenches and laid board drains in the form of the letter A, with a board bottom. When the boards have rotted they will leave the drain perfect, unless tree roots fill it. He thought that Mr. Ware had no right to expect his sewage to benefit his vegetable garden, for water will run down, and believed it would produce a much better effect on the grass.

Mr. Ware said that the pipe which he described was not intended for drainage, but for conducting water for irrigation—from a pond, for instance. It might be made to answer for drainage, but would not be as good as ordinary drain tile.

John B. Moore said that irrigation was very important where a proper supply of water could be obtained. He had studied this subject carefully, and if there was anything that he was proud of, it was his success in irrigation and drainage. He was not surprised at Mr. Ware's failure; the water would not go ten feet from the outlet before soaking into the ground. He thought it would be better to apply sewage on the surface, but if it will not make vegetables grow how will it make grass? The natural way of watering is by rain, and no one has yet improved on it. He had used water for artificial irrigation for two or three years, and by

means of it had made light, sandy loam productive, and succeeded in raising pears where he supposed it was impossible to grow them. Now that he has got water he needs manure. It is injurious to apply water in large quantities without drainage. The summer before last his sweet peas stopped blooming in July, and he let so much water on to the ground that when he attempted to walk on it he sank eight inches. The peas began to bloom again and continued until frost. He did the same last year, but they must have plenty of manure as well as water. He did not think it would pay to use water at the rate of twenty-five cents for a thousand gallons. He gets his supply from the Concord water-works, which have a hundred feet head. The Water Board can furnish water at low rates, and are ready to make liberal terms with gardeners. He did not believe it would pay to use water through a meter. No crop takes the moisture out of the soil more quickly than strawberries, and for these and other crops which soon suffer for want of water he lets the water run down the rows all night from half a dozen large pipes.

Mr. Wilder said that the secret how Mr. Moore produced his large strawberries had now come out, and that Mr. Moore did not sell his brains with his plants.

N. B. White had used sink drainage without perceiving any good results from it, and would rather have pure water than greasy matter from a cesspool, unless enough alkali were added to it to cut the grease.

James Cruickshanks spoke of the method of disposing of sewage in Edinburgh, where it is collected in a tank with a gate made so as to lift and let out the contents of the tank on mowing land. In this way five or six heavy crops were raised in one season.

President Gray said that the best crop of grapes he had ever seen was from vines watered with soap suds.

Mr. Atkinson said that the alkali used in making soap disintegrates the grease so that it would have a good effect on vegetation. When he succeeded Mr. Oldaker as gardener, he applied all the wood and coal ashes made in the house to the garden. This contained little bits of fat which were neutralized by the alkali of the ashes, and he thought that when thus neutralized the more of animal matter there was in manure the better.

Mr. Moore asked if the grease could properly be called grease after being changed by mixture of alkali.

Mr. Cruickshanks said that twice within ten years his sink drains had been so filled up with grease that he had been obliged to open and clean them.

Leander Wetherell remarked, in reference to the allusion that had been made to grease or oily matter as a fertilizer, that Prof. Stockbridge quoted William Cuthbert Johnson on this subject at the Winter Meeting of the Connecticut State Board of Agriculture, as follows: "He highly recommended for growing turnips, train-oil, and whale-blubber as manures. He mixed each with loam and then mixed ground bones with loam and each of the former two produced double the crop of turnips that the latter (the ground bone) did." Prof. Johnson of New Haven said, referring to the above quotation from Mr. Johnson of London, that it was the animal matter and not the oil that acted as a manure on the turnip crop. Reference having been made to the flesh of dead horses as a manure, Mr. Wetherell remarked that it did not act as manure or serve as food for plants until after putrefaction had taken place. He added that the same is true of blood. He referred to irrigation as introduced by Mr. Copeland, in Bridgewater, on quite an extended scale, he (Mr. Copeland) using iron pipes for conveying water where wanted for distribution on his garden grounds. He spoke of the beneficial effects of irrigation of grass land without manure. Light, heat, air, and water are the great factors of vegetable growth. Neither grease nor oil is a manure or fertilizer.

W. C. Strong said that the crops in New England cover the entire year and are as diversified as in any portion of the globe. He had two ice ponds, one of which was lower than the other, and this suggested to him the idea of winter irrigation. By letting the water from the higher to the lower, when the latter was frozen over he planned to thicken his crop in coldest nights. But he found that the water did not flow over the whole surface, but sank the ice in spots, unless carefully directed. The same mistake was made in irrigation so that the ground became sodden in one place, while the rest received no benefit. He thought that a considerable part of the benefit of irrigation arose from showering the foliage, especially at night, as in a greenhouse. The coolness is a positive benefit, and warm water would be injurious to carnations and many other crops. Distributing evenly is very important.

Mr. Philbrick said that he applied water in the sunshine sometimes, but that in general he did not like to. He preferred the

afternoon. In winter he waters in the morning to avoid mildew. Ordinary greenhouse plants will stand cold water, but it would be often fatal to tropical plants or to other plants in a tender state. He thought that grease injured only by filling the pores of the soil and preventing the circulation of air. Soap is different; the alkali possesses fertilizing properties. The benefit from dead horses arises not from the grease, but from the other animal matter.

E. P. Richardson had found a hose perforated with holes an eighth of an inch in diameter, and about three or four inches apart, very convenient for applying water. It can be led any where, in a straight or crooked line, and under plants which are injured by watering on the leaves in bright sun. His ground is sloping, and the water delivered from these small holes, will run down hill without washing. Such a hose may be left for hours without attention.

BUSINESS MEETING.

SATURDAY, February 2, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, President Gray in the chair.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

JOHN C. PHILLIPS, Jr., of Boston.
HAMILTON STEVENSON, of Woburn.

C. H. B. Breck, Chairman of the Committee of Arrangements, stated that his annual report for 1877 was not ready, and on motion of Hervey Davis it was voted that it be published without being submitted to the Society.

The President read a communication from Hon. William G. Le Duc, United States Commissioner of Agriculture, requesting models of fruits, etc., for the Paris Exposition. On motion of John C. Hovey the communication was referred to the Fruit Committee.

The President read a communication from Jonathan Periam, Secretary of the National Agricultural Congress, requesting the

Society to send delegates to the meeting of that body at Washington, on the third Tuesday in February.

Voted, That it is inexpedient to send delegates.

The President also announced a letter from Charles Pease, of East Rockport, Ohio, acknowledging the receipt of the resolutions passed by the Society in memory of his father-in-law, the late Professor Kirtland.

Adjourned to Saturday, March 2.

MEETING FOR DISCUSSION.

This was opened by the following essay, by William H. White, of Westborough, for which a gratuity was awarded by the Committee on Publication and Discussion, and which was read by E. W. Wood:

The Culture and Varieties of Roses.

Botanists enumerate some eighty or more species of the rose, while florists give us an almost innumerable number of varieties, of which but few are adapted for the general cultivator in any given soil and latitude. To enumerate the species and varieties does not come within the province of this essay, but it may be well to state a few of the leading characteristics of what I consider a fine rose, whatever the species or variety. Excepting the Moss rose, all varieties should possess foliage of a bright shining green, which color, to be perfect, needs to be permanent, although not likely to be found in many varieties, my preference being for a sort of evergreen foliage. However size, form, etc., may vary in different varieties, uniformity in the same variety is desirable. A fine rose is one which is rich and beautiful in all its stages of bud and blossom, up to, and previous to wide and full expansion. Single and double flowers, while enclosed within their calyxes, are alike beautiful up to a point where they expand to hide the calyx; but the double possess that characteristic which makes them magnificent when full blown, while the single are best shown previous to full expansion. Whatever difference there may be otherwise, the petals of all roses should be thick, broad, and smooth at the edges. The bud and blossom should possess fragrance, and the higher that fragrance the more valuable the variety. The flower should be double

to the centre, high on the crown, round in outline, with regularly disposed petals. The peculiar characteristics of any and all varieties should be strongly and fully developed in each flower.

Roses are cultivated in the open air, in the house, conservatory, etc., all of which naturally come within the province of an essay on the culture of roses; but that we may embrace the whole within circumscribed limits we must necessarily touch but briefly on minor details.

Soil. The proper soil for the rose is a strong, rich, friable loam, well drained naturally or artificially, neither too moist nor too dry, but with such a degree of moisture that the plants will never suffer from want or excess. But we are commonly restricted to "Hobson's choice," and provided with soil, such as we are obliged to use, already made. Such being the case we must supply any deficiency to the best of our ability. By aid of the present lights of science, and a little labor, we are enabled to largely modify and ameliorate almost any soil, often changing its entire character, and remedying defects in climate, etc. A fine rose cannot be grown in uncongenial soil, therefore it is idle to expect it. If the soil is poor or illy adapted, the blossoms will be but imperfect, perhaps radically different from those grown in soil well adapted to bring out its strong points. Thorough drainage is essential, and where this is had there is little danger of having the soil too rich; and even when it may be thought sufficiently rich, the addition of a little well decomposed manure or compost will be advantageous. There is no fertilizer better adapted for the rose than decayed turf from an old pasture—the older the pasture the better—mixed with old cow manure; and especially is this invaluable in pot culture, where the cow dung should be in excess of that needed in out-door culture. I have grown and blossomed roses in clear cow dung, which has lain out and was gathered from pastures, and pulverized when dry, but I think a portion of soil, to give cohesiveness, is better. Recollect that the best of soil and careful attention is the price of successful rose culture, and that the soil is just what we have the will to make it, when it is otherwise than an appropriate one for the rose.

Manures for the Rose. Roses are high livers and like food in plenty; a meagre diet will not answer the demands of a fine rose. Of all animal manures that from the cow seems to be the best adapted to the wants of the rose, but the manure, from whatever animal it may be, should be well rotted or decomposed, and be well

incorporated in the soil. Thin turf, from an old pasture, well decayed and mixed with the manure, several times turned, is one of the best of rose fertilizers; another good one is composed of one part Peruvian guano, three of decayed turf and six of cow manure, all well mixed and made fine. The turf should be from some rich old pasture, just thick enough to embrace the main part of the grass roots. Pig dung, soot, and wood ashes, are each and all good, when composted or applied as top-dressing and well worked into the soil. All manures should be administered in allopathic, instead of homœopathic doses. Soapsuds are excellent fertilizers and renovators, applied to root and branch. Solutions of guano and other manures in water are excellent, and are generally best applied at night or just before rain. If applied to the roots at any other time the top soil should be removed, making a sort of basin around the stem, the liquid poured in and the soil returned; in this way no crust forms on the surface.

Planting the Rose. Tender and half-hardy roses, when planted in the open ground, should be planted only in spring; the hardy sorts may be planted either in spring or fall, although I prefer spring planting. It should always be early spring or while they are dormant when the plants are set. Tea-scented and other tender sorts should not be planted out-doors until the danger of spring frosts is past. To plant a rose properly the roots require the first attention; every bruised, ragged, or torn root should be cut off smoothly above the wound; tap or downward growing roots should be shortened to discourage downward growing: cut back the top at least one half, if not already done, in order to keep the balance. Have the holes dug sufficiently large to receive the roots when fully spread; loosen up the ground in the bottom, and mix in several inches of rich surface soil for the rose to stand in and over. Place the plant in the centre of the hole, so that its collar will stand even with the level surface of the ground, unless it be a budded or grafted one, when it should be set deeper: then fill in the rich soil so that every root and branchlet of root shall be closely embedded therein; the soil should come in close contact with every portion of the root, for on this depends the success of planting. Moderate firming of the soil, only sufficient to hold the plant firmly, is all that is necessary, when the soil is in contact with the whole root. Unless the plant is of the dwarf sort, a stake should be firmly set and the plant tied to it. The mode

of planting, whether singly, in groups, or in beds, must be governed by the circumstances of the individual planter, but does not in any way affect the manner of setting in the ground. If planted in groups the taller growing are best set in the centre, or in the background, grading downwards to the outside; if in rows they should be at proper distances, so that each shall form a specific object in itself, as well as a portion of the row. Planted singly on the lawn they form beautiful objects, and ought to be each distinct from the other, blooming at different periods; but where set in clumps or beds they make a greater show to blossom at the same time. The situation for planting roses, especially the tall growing sorts, should be one somewhat sheltered from strong winds, and the trellises or supports should be set out before planting, and be firmly fixed in the ground.

Pruning. The pruning of out-door roses is best performed in March or April, and must be in accordance with the habits and requirements of the particular variety. While some do best with only moderate pruning, others require to have one-half or two-thirds of the last season's growth removed; but with all pruning a well shaped top should be kept in view; this can be attained by a combination of cutting and tying to position. The terminal bud at the cut should be left in the position which will most readily promote the growth of the desired form; for instance, if a more spreading form is desired, cut so as to leave the bud on the under or outer side; if a compact or upright head is sought, the reverse course should be pursued. Strong, healthy wood is always desirable, therefore in pruning cut out the weaker, reserving the strongest to make the new growth from. Always prune with a definite and fixed form or object in view. Vary the pruning with the requirements of the different varieties, and also for the positions they are to occupy, whether as standards, over pillars, flat trellises, walls, etc. If you desire quantity, regardless of quality in bloom, cut and disbud sparingly; but if quality is the first object, cut out all weak wood, and then cut away all wood of last year's growth down to one, or at most two eyes, and then you may go still further and cut out one-half of what is left. If with judicious pruning your roses do not produce magnificent blossoms you may conclude that there is something wrong or wanting in the soil, provided the season is an average one. Perhaps it needs some fertilizer added; rich loam or decayed turf mixed with its bulk of rotted dung, is

better than clear manure and should be well worked into the soil around the roots; work it in in a circle equal to the circumference of the full spreading top.

Budded roses sometimes send out suckers or shoots from the stock; in planting such, it is well to set them with the junction of the stock and bud below the surface, so that the budded portion may form roots of its own, and thus become independent of the stock. Watch for any indication of suckering, and rub out all buds before growth is made.

Pot Culture. If out-door culture of roses is comparatively simple and easy the culture in the house, conservatory, etc., is generally attended with many difficulties. For pot culture we select the tender or monthly classes, though with care some other sorts may be grown with moderate success. I shall confine myself to dwarf and tender varieties; and these must be selected with reference to the care, etc., which can be accorded them by the cultivator. And first, as to pots—these should be clean, free from mould, and large enough to correspond with the size of plant and roots to be grown in them. Potting soil should be composed of old pasture turf, loam, and rotted cow manure, in about equal proportions, or woods earth and sharp sand may be substituted for turf or loam—say one part of sand, to three or four of woods earth, and the same of manure. Provide good drainage by placing potsherds or charcoal in the bottom, which should have a hole in it, and be raised a little from the saucer so as to allow the air to circulate; cover the drainage material with soil; then place the plant in the centre of the pot with the roots well spread; fill in among the roots with fine soil, using every care to bring the soil in contact with each root and every part thereof, firming it moderately, after which give a gentle watering. If this potting is done before it is desirable to place the plants on the stand, the pots should be plunged out-doors in a somewhat sheltered position in sawdust, tan bark, or some like substance, to prevent drying out, there to remain till desired to place in the house or conservatory. When the plants are potted they should be pruned, as a general rule shortening in about one-half. As a general thing the temperature of our living rooms is subject to too great variations and the atmosphere is also generally too dry for successful cultivation of the rose; to remedy these defects great care should be used in parlor culture to keep an equable temperature, with suitable ventilation, and then to frequently shower the

plants. In the conservatory and greenhouse the temperature can be more equably maintained and we can measurably remedy a dry atmosphere by evaporation of water, but we may fail by giving too much moisture, causing mould, etc.; good judgment and much experience are required to keep the temperature and atmosphere in just the right state, for doing which no arbitrary rule can be given.

The soil of the pots must not be allowed to become dry or be sodden from too much wet; water well and *thoroughly* when water is given; dig up and stir the soil in the pots occasionally, as far as may be without disturbing the roots. Cut back the plants freely after blossoming, or, which is better, cut back blossom and stem as soon as they have matured. The stronger and more stocky the plant, the better it is able to support itself and produce fine, healthy blossoms. Use the greatest care not to allow the plants to become drawn, but give fertilizers in liquid form freely. Study in all your culture to render it *suitable* to the plant and the object in view.

Propagation. There are various methods of propagating and multiplying roses; such as by seed, budding and grafting, and offsets or suckers. For budding and grafting, stocks of some hardy inferior kind are generally used. The mode of budding and grafting does not vary materially from the same process with other woody plants and trees, and need not here be described.

Protection to roses left out during the winter is advantageous even to those which are quite hardy, while it is essential to those less so. The Tea, Bengal, and Noisette classes may be left out during the winter by covering with sand or earth, but usually the top dies and new growth only comes from the roots. Evergreen boughs secured around the more hardy sorts are generally the only and best protection they need or can have; where the sorts need more protection, the plants may be laid flat on the ground and covered with sand or earth an inch or two deep.

Insect Enemies. Whoever grows roses, out-doors or in, and is not troubled with insects injuring foliage or blossom is a highly favored and fortunate individual; for it seems of late that each plant and product from the soil has its peculiar insect enemies, which prove a drawback on our pleasure and a hinderance of our interests, to escape from which there is no patent or royal highway, but they must be firmly met and manfully fought. Still, where proper attention is given to soil, watering, planting, etc., and a few

simple precautions and directions are heeded, little trouble or annoyance from insects need be anticipated. In house culture the aphis and red spider are the most formidable; for the first, fumigation with tobacco, when it can be done, is the best thing. but if the aphis is any ways abundant the plants will need fumigating at least twice, a day or two intervening between the fumigations, to be sure of the destruction of all, with the young. Where the use of tobacco is objectionable, four ounces of quassia chips, boiled in four quarts of water ten minutes, with four ounces of soft soap dissolved in the liquid, and applied with a soft brush to every part, leaf and branch, of the plants, after fifteen or twenty minutes syringing the plants with pure water, will answer as a substitute. Out-doors in May, or as soon as the leaves begin to grow, the rose caterpillar begins to glue the leaves together, to form a shelter for itself. Go over the plants frequently and pinch these folded leaves, thus destroying the insect; this is the most simple and efficacious remedy, if it be a little revolting to the very fastidious. For the sawfly larvæ, and other later appearing insects, syringing with a solution of four ounces of whale oil soap in four gallons of soft water will usually destroy them; where this proves inefficacious, powdered white hellebore, sprinkled over the foliage while wet, will prove effectual; but let no one think that a single application of any one remedy is all that may be needed during one season, but be prepared to repeat whenever necessary. The rosebug or rose chafer, is a pest which often destroys the blossoms, its nature depriving us of the opportunity to attack them except in the perfect state; and then we must destroy them by pinching their heads, stamping on them, and scalding; a little daily attention for five or six weeks will effectually dispose of them. Toads are fond of them and will dispose of large numbers when an opportunity is given them.

Mildew sometimes attacks the rose, and is usually caused by extremes of heat and cold, excessive and continued dampness, with continuous cloudy weather, too little bright sun and fresh pure air; sprinkling with sulphur and soot are remedies, but caution must be used not to give the sulphur too freely, or it will destroy the foliage.

To sum up, I would only add, that the whole culture is comprised in the seasonable, careful, judicious, and sensible application of the natural laws of cause and effect.

I herewith subjoin a list of such hardy and tender varieties as I

believe to be best adapted for general culture in our New England climate.

CHINA. *Agrippina* or *Cramoisi Supérieur.* — Rich, velvety crimson; moderately double.

Ducher.—Pure white; medium size, free bloomer, good form.

Eugène Beauharnais.—Bright amaranth; fine form and fragrant.

Impératrice Eugénie.— Silvery rose; large and fragrant.

Jacksonia.—Bright red; very double.

La Superbe.—Purple crimson; very double, opening uniformly well.

TEA. *Adam.*—Rose, salmon centre; large and full.

Bon Silene.—Rosy carmine, shaded with salmon; fragrant and free blooming.

Catherine Mermet.—Bright flesh color; large, full, and of fine form.

Isabella Sprunt.—Sulphur yellow; resembles Safrano, except in the color of the flowers.

Madame Camille.—Delicate rose; large and full; of good habit, and free from mildew.

Marie Van Houtte.—White, slightly tinged with yellow; large and full.

BOURBON. *Duchesse de Thuringe.*—White, slightly tinged with lilac.

Du Petit Thouars.—Crimson; fine and hardy.

George Peabody.—Dark, velvety crimson; an American variety.

Hermosa.—Bright rose; a very constant bloomer.

Queen of the Bourbons.—Fawn and rose; very fragrant, and a profuse bloomer.

Souvenir de la Malmaison.—Delicate flesh color, tinted with fawn; large and double.

NOISETTE. *Aimee Vibert.*—Pure white; single, small, blooming in clusters; hardy.

Celine Forestier. Pale yellow, deeper towards the centre.

Cloth of Gold.—Deep yellow centre, with sulphur edges; rather shy, but magnificent in bloom.

Lamarque.—White, with sulphur centre; flowers in clusters; fine climber under glass.

Pumila.—Salmon, shaded with rose; free bloomer.

Solfaterre.—Sulphur yellow; large, double, fragrant.

HYBRID PERPETUAL. *Alfred Colomb.*—Crimson, shaded with carmine; full, globular form; large, fragrant.

Charles Lefebvre.—Reddish crimson; velvety, rich, large, full and well formed; fragrant.

Countess Cecile de Chabrillant.—Deep pink; medium, full, perfect cup form; fragrant.

John Hopper.—Bright rose with carmine centre; large and full.

La France.—Delicate silvery rose; large, full, globular form, constant bloomer; very sweet.

Madame Victor Verdier.—Brilliant carmine crimson; large, full, globular and free bloomer; fragrant.

MISCELLANEOUS. *Baltimore Belle.*—Pale blush, changing to near white; compact and double.

Queen of the Prairies.—Bright rosy red, frequently with white stripe.

Blanchefleur.—White, slightly tinged with flesh; very fragrant.

Madame Hardy.—White; large, very fragrant and free from mildew.

Persian.—Deep bright yellow; small but prettily shaped; very early.

White.—Pure white; very double, with the delicate fragrance of the violet.

DISCUSSION.

The President being obliged to leave, the chair was taken by Rev. A. B. Muzzey, of the Committee on Publication and Discussion.

M. H. Merriam said that he had listened to the essay with much interest, but there were some things not mentioned or even suggested in it. One is the inquiry why as good success in forcing roses has not been attained south of this as here, so that New York is in large measure dependent on Boston for its forced roses. The case is similar in Philadelphia, where the winters are still milder, and also in lower latitudes. How can the outside climate affect roses grown under glass, where we have control of the climate? Another point is, whether in cutting roses to leave one or two buds for future development or to cut close, or on older wood. Certain treatment develops wood, and other treatment develops fruit. What is the cause of "blind" wood with few flowers? What is the effect of chemicals, such as oxide of iron, on the color of roses? What is the effect of an extra supply of carbonic acid gas? Some

experiments have indicated beneficial results. Is the decay of leaves on roses a disease, or is it caused by a fungus, or by too much water? The diseases of roses generally is an interesting subject; are there specific symptoms, and if there are, what are they, and what are the remedies?

N. B. White asked whether the failure to grow roses south consisted in a failure to get a good growth of wood, or whether wood was produced without flowers.

Mr. Merriam had no particular information on the subject.

James Cruickshanks was satisfied that if we had good hardy wood, the more closely we prune, the better roses we get. He had covered a bed of Moss roses with moss from the woods, pruned to two or three buds, and pegged down the shoots, and the bed made a complete flame of flowers.

The discussion, owing to the engagement on committees of several gentlemen who would otherwise have taken part, was not as extended as usual. The Chairman announced that on the next Saturday Professor W. O. Atwater would speak on Fertilizers.

MEETING FOR DISCUSSION.

SATURDAY, February 9, 1878.

A meeting for discussion was holden at 11 o'clock. William C. Strong, Chairman of the Committee on Publication and Discussion, presided, and introduced Professor W. O. Atwater, of Wesleyan University, Middletown, Conn., to lecture on Fertilizers.

Professor Atwater said that he proposed to give, not a formal lecture, but rather a "talk," on the general subject of plant food, as supplied by soils and fertilizers, and should first state some important principles. The character of the soil as to moisture, texture, warmth, etc., is very important, but its supply of plant food is even more so for the growth of crops. Every plant in order to grow must have food. This is not a newly discovered principle, but, until quite recently, no one has known just what ingredients are necessary to the growth of plants. Prof. Atwater here described some experiments made by Nobbe, to test the importance of the

various ingredients of plant food, the description being illustrated by a diagram, representing several buckwheat plants growing in different solutions of plant food, — one with all the ingredients needed; one with all but potash; one with nitrogen omitted; one without phosphoric acid, and so on. It was found that if any one essential ingredient was not supplied in sufficient quantity, the plant would not grow. A solution containing all the necessary ingredients, is known as a normal solution. In such solutions plants are raised as large, as healthy, and in every way as perfect as those grown in the soil. Wolff raised in such a solution four perfect oat plants with forty-six stems, and 1,535 well developed seeds. Nobbe obtained a Japanese buckwheat plant, nine feet high, weighing, air-dry, 4,786-fold the weight of the seed, and bearing 796 ripe, and 108 imperfect seeds. And Professor Knop used to delight in showing his friends a young oak tree, very small indeed, but the growth of which had been normal, though its roots had been immersed only in aqueous solutions. The results of a vast amount of this sort of experimenting all point in one direction, and prove this principle.

No agricultural plant can attain full growth without a sufficient supply, through its roots, from the soil, of *potash*, *lime*, *magnesia*, *iron*, *phosphoric acid*, *sulphuric acid*, and some compound of *nitrogen*.

Besides these, chlorine, and perhaps silica, are sometimes, if not always, indispensable, though in very small proportions, to complete development. If any one of these *essential ingredients* be lacking, the plant will suffer in growth and development.

Such experiments as these, coupled with practical experience in the field, have led to almost a revolution in our views of fertilizing. We have learned that we must put on manure to feed plants. But there are various important conditions of the successful working of manure, among which are proper tillage and thorough mixing of the fertilizers with the soil. The indirect action of fertilizers is a very important point.

Every soil, however barren, is capable of furnishing some plant food. In what are called "worn-out soils," the available supply of one or more ingredients is generally insufficient.

In experiments with buckwheat plants grown in boxes of sand taken from the well-known barren plains in Wallingford, Conn. (on the line of the N. Y., N. H., & H. R. R.), the plants grown with-

out phosphate were nearly as tall as those with a complete fertilizer, but were slender and the seeds were deficient in weight; without potash the same as without phosphate; while without nitrogen, the growth was almost nothing, showing that this soil lacked available phosphoric acid and potash, and, most of all, nitrogen. Some soils will grow almost anything that is planted on them; such soils possess all the ingredients of plant food.

Prof. Atwater said that he had received hundreds of letters, of which the burden was, What shall I put on my soils to produce crops? If all soils were alike in their ways of supplying crops with food, and all crops alike in their ways of using it, the answers to such questions would be easy; as it is, it is impossible to lay down rules to cover all cases.

The chief value of fertilizers is their plant food. The main use of guanos, phosphates, bone, fish, potash, salts, and the like, is to supply the crops with food which they cannot get enough of from the soil. The rule in buying them should be to select those which supply in the best forms and at the lowest cost, the plant food which the crops need and the soils fail to furnish.

We may take it as pretty well settled that the only ingredients of plant food which we need supply to our soils, are *potash*, *lime*, *magnesia*, *phosphoric acid*, *sulphuric acid*, and *nitrogen*. Iron and chlorine are necessary to the perfect growth of plants, but only in minute quantities. Silica and soda are needed, if at all, in similarly small proportions. Every ordinary soil supplies these last four substances in abundance.

Of the above list, the magnesia is rarely deficient in even "worn-out" soils. Sulphuric acid and lime are more often lacking, and hence, doubtless, one reason of the good effect so often observed from the application of lime and plaster. The remaining substances, *phosphoric acid*, *nitrogen*, and *potash*, are the most apt to be deficient. In some soils one, in others several or all, of these may be wanting. When we say the ingredients are "wanting," we do not mean that the soil does not contain them, but that it does not supply the crops as much as they need. It is not so much because our "worn-out" soils have not enough plant food in store that crops starve upon them, but rather because the food is locked up in such combinations that the roots can not get at and use them. Such is the general result of the best testimony that experience and experiment have placed at our disposal.

It was once thought that the chemical analysis of a soil would easily reveal its deficiencies in plant food. But later experience has shown this to be, at best, a costly and very defective source of information. Different samples of soil, taken from different places in the same field and at different times, may vary widely in composition, and, what is a still greater difficulty, the chemical tests which prove the presence of a given ingredient in the soil, do not tell whether it is already in such a form that the plant can use it, nor whether or how soon it may become so. And there are many other factors of vital importance to the development of the plant which soil analysis does not reveal.

To find what materials crops remove from the soil is an easier matter. Thousands of analyses of the more important vegetable products have been made, nearly all in Europe, however, and we have tables prepared from them giving the average composition of our field crops. From these any farmer may calculate how much plant food a given crop takes, on the average, from his soil. The figures might possibly fit his case no closer than would the calculation of his own weight from that of the average European, but they will suffice well enough for practical purposes.

Formulas for fertilizers for special crops are frequently based upon calculations of this sort. For instance, a crop of fifty bushels of corn, with the stalks, would take from the soil, on the average,

Nitrogen, - -	76 lbs.	Magnesia, - -	23 lbs.
Phosphoric Acid, -	51 "	Lime, - - -	27 "
Potash, - - -	72 "	Sulphuric Acid, -	8 "

Now we may assume that nitrogen, phosphoric acid, and potash, are the only substances the soil will fail to furnish in plenty, or that, if lime and sulphuric acid are needed in addition, there will be enough in the superphosphates and other materials to be used, to supply them. We have then to provide 76 lbs. of nitrogen, 51 lbs. of phosphoric acid, and 72 lbs. of potash, in forms readily available for plant food.

We could supply the nitrogen in, say, 760 lbs. of dried blood, at a cost of about $15.40, the phosphoric acid in 340 lbs. of dissolved bone black, costing $6.00, and the potash in 144 lbs. of muriate of potash, costing, say, $3.20. This would make for our 50 bushel corn crop, 1,244 pounds of fertilizing material, at a cost of $24.60. It would be a costly application, even if it were sure to improve the yield by fifty bushels.

But need so much of all these ingredients be used? The crop may have the power of making use of the compounds of nitrogen already stored in the soil or supplied by the atmosphere, so that at least a part of the $15.40 worth of nitrogen will be superfluous. The application of gypsum is often equivalent to the addition of potash, since gypsum tends to liberate this from its combinations in the soil, and thus render it available to plants, and so we may get our potash at a good deal less cost than in the $3.20 worth of potash salts. Or, for that matter, the soil will very likely supply plenty of potash and we may leave it out of account entirely in our formula. The physical condition of the soil affects very materially the feeding of plants and the action of fertilizers. For these, and various other reasons which this is not the place to discuss, and which are, in the present state of our knowledge, very imperfectly understood, the formula, however attractive in theory, might be far from the most economical, in fact.

One of the chief defects of formulas on this plan is that they take no account of what we may call the feeding capacities of the crops. A vast deal of experience in the laboratory and in the field bears concurrent testimony to the fact, though we know as yet very little about how or why it is so, that different kinds of plants have different capacities for making use of the stores of food that every soil contains. Clover will get plenty of nitrogen where wheat will fail for lack of it. Nitrogenous manures help clover but little, and are almost a specific for wheat; and this, notwithstanding clover contains a great deal, and wheat but little nitrogen. Lawes and Gilbert found that a soil from which a clover crop had just been removed, contained more nitrogen than it did before the clover was put in; that, in other words, the soil, to the depth of nine inches at least, was positively enriched by the growth and removal of a highly nitrogenous (clover) crop. The nitrogen for a clover crop of two tons on this plan would cost perhaps $16. To buy and use it — at least so much of it — would be absolutely wasteful.

The analysis of a plant is a very incorrect standard for the fertilizer to apply to it. The idea of fertilizing on this basis is old, simple, attractive, costly, partly rational, and often profitable. It is a step in advance of the common plan of using fertilizers at random. But it is uneconomical in the extreme.

The next step in advance would be to fit the fertilizer to the actual demands of the crops. This may be done by classifying

crops according to their predominating requirements, and adapting formulas to the several classes. For general and indiscriminate use, where the character of the soil and other special conditions cannot be taken into account, this plan is open to less objections than any other.

But, even if our knowledge of the laws of plant nutrition were sufficient for accurate calculations, as it is not, this plan would still leave several very important factors out of account. The weightiest is the supply which the soil can itself furnish. The next step in advance, then, must be to test the soils.

The farmers near Middletown (where Professor Atwater resides), need potash; in other places, potash does little or no good. How shall each of us ascertain what our soils most need? There is no better way than to try experiments on a small scale before making large investments; to put the question to the soil with different fertilizers and get the answer in the crops.

The best agricultural chemists in this country and in Europe, are agreed in this opinion. Stoeckhardt, Knop, Wolff, Ville, and Voelcker, have all recommended farmers to try experiments to test the action of different fertilizing materials upon their soils. Of course, there are soils so uneven that experiments on a small scale cannot be decisive. Nor will a single crop tell the whole story. To get the best results, the experiments should be carried through a series of years, — through a course of rotation, for instance. The soil should be without previous accumulations of fertilizing matters to interfere with the action of the fertilizers. By proper care, trials may be made which will bring valuable results at comparatively little cost.

Acting on these principles, the Connecticut Experiment Station, of which Prof. Atwater was Director, in the spring of 1877, sent out to as many farmers, nearly fifty sets of fertilizers, with directions for experiment. It was recommended that these experiments should be tried on long parallel strips of ground, as likely to give greater average uniformity of soil than the same area in a square. Nearly twenty of these farmers have reported, and their reports are in accordance with what has been said. There is a great difference in soils, and what produces the desired effect in one case, may not in another.

Prof. Atwater described an experiment made by D. H. Birdsey, of Middlefield, Conn., on six plots, the first of which was manured

with dried blood, furnishing nitrogen; the second with superphosphate; the third with a potash salt; the fourth with a mixture of the first two; and the fifth with a mixture of all three. Each of these plots contained ten square rods and received twenty pounds of fertilizer. The sixth, which was of the same size, was manured with barnyard manure at the rate of five cords to the acre, hen dung and ashes being added in the hill. The plots were all planted with corn. On the third plot, with potash salt; the fifth with dried blood, superphosphate, and potash salt; and the sixth with yard and hen manure and ashes (which also furnished potash), the crop looked well through the season, the stalks were large and strong, the ears well filled, and the grain good. On the plots without potash the growth was very poor, the stalks small, weak, and yellow, and the ears poorly filled. This experiment was not in all respects perfectly accurate, and its results are not to be taken as mathematically exact; but the fact that on the three plots where there was no potash the crops uniformly failed, and that on the plots where potash was applied they were uniformly good, shows that the weak point of this soil was potash, and that the strong point in any fertilizer applied to it should be potash. The fifth plot, with potash only, producing as good a crop as the fifth or sixth, which had potash and other ingredients, is a strong indication that the soil already contained enough of all materials except potash. But in the next field the case may be different. The potash salt on the third plot would cost at the rate of $6.72 per acre, while the yard manure on the sixth plot cost $40 per acre, besides the ashes and hen manure.

In a very careful experiment on sixteen plots, with as many different fertilizers, by W. I. Bartholomew, of Pomfret, Conn., in every case where phosphoric acid was omitted the crop failed, and in every case where it was applied in any form, either by itself or in combination with other substances, the crop succeeded, and the quantity of corn was remarkably in the proportion of the phosphoric acid applied. What this soil most needed was clearly phosphoric acid.

An experiment by Chester Sage, of Middletown, Connecticut, resulted in failure, in every case, except where a complete fertilizer was used. Dried blood, superphosphate, potash salts, and plaster alone, each brought crops no larger, and, if anything, poorer in quality, than where no fertilizer was applied. The mixture of

dried blood and superphosphate, corresponding to a first-class "ammoniated" superphosphate, did scarcely any better. In each case the crop was, as Mr. Sage says, "all refuse corn and hardly worth saving." But with the complete fertilizers, the yields were good. Hen manure, which furnished all the ingredients of plant food, brought about forty bushels of shelled corn per acre. The mixture of dried blood, superphosphate, and potash salt, which cost at the rate of $16 per acre, and furnished nitrogen, phosphoric acid, and potash, but doubtless in larger quantities than the hen manure, brought sixty bushels of very fine corn to the acre. "This," Mr. Sage says, "was such a crop as I like to have. It grew well all summer, and the corn was very fine. The stalks were large and green when the corn was ripe, and will make excellent fodder." This soil showed the need of a complete fertilizer.

A similar series of experiments was made on the farm of the Maine Agricultural College by a student, Mr. Lufkin, under the direction of the Professor of Agriculture, Mr. Farrington. In these experiments potash did little apparent good. Potash salts alone, improved the yield very slightly, or not at all, and fell far short of paying their costs. Mixed with dried blood and superphosphate, the case was a trifle better. On other portions of this field, Prof. Farrington had no success with kainit, and found leached ashes to help grass as much as unleached. Among the crops most apt to be helped by potash are grass, potatoes, roots, and the leguminous crops, which include beans. None of these got any apparent benefit from the potash here. On the whole, potash does not seem to be needed on this land.

The only case where dried blood alone seemed of any use was with potatoes; but with phosphoric acid it evidently increased the crop in several cases.

Phosphoric acid was uniformly and largely beneficial. The superphosphate alone, gave the largest potato crop of all. It also served an excellent purpose with nitrogen there, and the two together brought the best yield of turnips on the field.

Taking all in all, as tested by the crops and fertilizers named, the chief need of this soil seems to be phosphoric acid; the next nitrogen. In its present condition it does not seem to call for potash.

As indicated by the experiments, this is a soil on which artificial fertilizers of the right kinds, and with the right crops, can be used

with great profit. Some soils give but little return for manures applied; others respond bountifully to even small applications. Such, the Germans very aptly term "thankful" soils. This is one. Left to itself it seems to be able to do very little, but with a very little help it brings good crops. On the supposition that the single plots without manure were fair samples of the whole, notwithstanding the large quantities used and the high prices allowed, the nitrogenous superphosphates gave, with potatoes and turnips, a gain of from $50 to $80 per acre. But while the fertilizers brought such profitable returns of potatoes and roots, with beans there was almost uniformly a loss. This accords well with what Mr. Lawes, of England, says as the result of thirty years' experimenting and practice with fertilizers, that "it is not advisable to sow artificial manure with beans, peas, tares, or other leguminous plants. Corn, *i. e.*, grain, and root crops, will take all the artificial manure which the farmer can afford to pay for."

Prof. Atwater said that he did not feel justified in making many generalizations from these experiments, though future experience might warrant more. One or two points were, however, worthy of mention. The cases in which nitrogen, in the form of dried blood, by itself, appeared, in the reports, to be especially beneficial to corn, were very few—not more than one in ten. He did not think this could all be due to the wrong application or excessive quantity of the dried blood used. Doubtless, if the nitrogen had been in the form of sulphate of ammonia, or nitrate of soda, or Peruvian guano, the results would have been very different. Still, it looked as though the corn crop did not require the application of very large quantities of nitrogen in fertilizers.

Superphosphates proved beneficial in nearly every case where the trial was a fair one. At the same time there are numerous well-attested cases of worn-out soils in which phosphoric acid was evidently not needed.

As regards potash, out of twelve cases in which farmers in the vicinity of Middletown had reported their experience last season in these experiments and in their field practice, potash salts were apparently profitable in ten, and without benefit in two. Elsewhere, the reports average less favorably for potash salts.

These experiments illustrate how crops vary as to their feeding capacity; how soils also may vary, and that these two factors must be taken into account. The whole matter may be summed up into

the advice: First, use all the manure that is produced on the farm; then, since most farmers in the older states need something more, experiment to ascertain what fertilizers produce the best effect. Whoever will use fertilizers economically and profitably, must select the ones that supply the materials which his particular crops need, and his soil fails to furnish. And the question what is most needed in a given case, can be tested in no better way, — indeed, in no other way than by direct experiment, — by putting the question to the soil with the fertilizers, and getting the answer with the crops. Of course, the effects of weather, tillage, physical character of the soil, indirect action of the fertilizers, and so on, count for a great deal, and the most reliable results will come only after repeating the experiments for a series of years, through a course of rotation of crops, for instance.

Leander Wetherell asked how Mr. Birdsey's soil was treated before the experiment.

Prof. Atwater replied that in that region the farmers had long been in the habit of using a good deal of bone, superphosphates, guano, and fish. These supply phosphoric acid and nitrogen, but little or no potash. Mr. Birdsey says that on this particular soil, bone used to produce an excellent effect, but of late he sees scarcely any benefit from it. It would seem as though this land had become relatively over-charged with phosphoric acid and deficient in potash.

Benjamin P. Ware spoke of farmers in Danvers who raised large crops of potatoes of superior quality, year after year on the same land, with Peruvian guano, so that the principle has been established that guano does well there. Probably this would not apply to all soils.

Prof. Atwater saw no reason why this should not be so on farms in Danvers, nor any reason why on others the case should not be different. Phosphoric acid and nitrogen are the ingredients most often lacking in our soils, and are supplied abundantly and economically in Peruvian guano. Prof. Atwater spoke with approval of the process of "rectifying" Peruvian guano, which, as imported, contains large lumps and some stones, and not much sulphuric acid. In rectifying, the stones are removed, the lumps pulverized, and the whole mixed to make it uniform. Sulphuric acid is added, as to bone and mineral phosphate, to make the phosphoric acid more readily soluble and to fix the ammonia.

The rectified guano is sold in immense quantities in Europe, where its use has increased uniformly since its first introduction.

Prof. Atwater added that the indirect action of fertilizers counts for a great deal. Fertilizers often help plants to get food from the soil which otherwise would be inaccessible to them. This helps to explain the action of plaster.

Fertilizers give rise to chemical changes which liberate other plant food in the soil; as to how they effect this, we are much in the dark. We should not however despair of ascertaining. Twenty years ago no one could say whether potash was necessary for the food of plants, but now we know it is. The increase in our knowledge of the laws of plant growth, and of what has to do with successful crop growing and stock raising, has, during a comparatively few years past, been simply immense. Take away from our agriculture what has been added to it during the last fifty years by that accurate and rational observation and experimenting which constitutes true science, and it would be very little in advance of that of the Romans.

Dr. Peter Pineo thought that a rational and satisfactory explanation of the effect of gypsum or sulphate of lime, which produces remarkable results on some soils, while in others its action is negative, might be found in the well-known principles of chemical affinity, where two substances of different chemical combination came into contact — as in solution — forming new compounds, and liberating gases. For instance, carbonate or phosphate of soda or potash, coming in contact with tartaric acid, or sulphuric acid, in solution, will have set free carbonic acid, or the phosphates, and tartrate or sulphate of soda or potash will be formed. It is well known that wood ashes coming in contact with hen manure will set free the ammonia.

We have a well marked case of double elective affinity, in the familiar experiment of sulphate of zinc and acetate of lead, which, when brought together in solution, produce two new compounds. The sulphuric acid leaves the zinc and combines with the lead, for which it has a stronger affinity, forming sulphate of lead, while the acetic acid combines with the zinc, forming acetate of zinc. These processes which we see in the chemical laboratory are clearly explanatory of those wonderful effects obtained in the vast laboratory of Nature.

The gypsum, or sulphate of lime, applied to some soils, will

find elements with which to make new combinations, setting free in a condition available for plant food the nitrogen, the phosphates, or potash—the three great staple fertilizers—which, according to Prof. Atwater, if present in, or applied in sufficient quantity and available form to any soil, will be quite sure to find an abundance of the other and less important elements, to insure a good crop.

Prof. Atwater, in answer to an inquiry, said that he had made no experiment in the application of sulphuric acid directly to the soil.

Mr. Wetherell had read an account of its application in a very weak solution, with the effect of increasing the crop. It was inferred that it set free plant food.

John B. Moore being asked to express his views of the subject under discussion, said that he was exceedingly pleased with Prof. Atwater's address, and that he agreed so fully with it that he had nothing to add.

Mr. Wetherell thought that what Mr. Moore had said was the highest compliment that could be paid to Prof. Atwater's lecture.

O. B. Hadwen said that Prof. Atwater had shown the values of different fertilizers as applied to different soils, but still he told us that the seasons and other circumstances affect their operation. It was a surprise to him that these fertilizers are as regular in their effect as they are. They will be especially valuable to all who have lands difficult of access.

The Chairman remarked that fruit growers apply the same fertilizers to different trees and wonder that their apples do not do as well as their pears.

Mr. Wetherell had tried a set of the fertilizers mentioned here, and common land plaster produced a better effect than any one ingredient or any combination, or than the Stockbridge fertilizers. This puzzled him, but Prof. Goessman said it showed that the cheapest of the ingredients was the best for that land. What we want is to save the expense of carting heavy barnyard manure, which, Lawes says, contains only sixty-two pounds of plant food in a ton.

Prof. Atwater said that it puzzled him to know why things should behave in a certain way in one soil, and in an entirely different manner in another. He did not mean to say that the three substances which he had spoken of as most generally deficient, were the only ones that should be applied to our soils. He thought the

good effect of plaster was its indirect action, which is a convenient term for covering our ignorance. Plaster serves directly as plant food. Water passing through soil mixed with plaster, brings out more potash. Plaster fixes ammonia, and by preventing evaporation, is beneficial in drought. Even with our imperfect knowledge there are many ways in which we can conceive of the beneficial action of plaster.

Mr. Hadwen said that it is impossible for the farmer to extract the sixty-two pounds of plant food from a ton of manure. It is easier to haul the whole of it on to the land.

Prof. Atwater said, supposing it contains but sixty-two pounds of plant food, this is not all its value. To get the largest possible crop on his land, Mr. Lawes, in England, would use chemicals. But in England, where there is less drought than here, and on a naturally strong soil, these might answer as well as the manure. Here, however, the evaporation is immense; the rains settle down into the subsoil, and in dry weather come up again. If we could prevent them from escaping we should have no drought. Manure in the soil may retard this evaporation. The other 1,938 pounds in the ton undergo chemical changes in the soil, improve its texture, and turn into active forms the inert plant food the soil contains.

Mr. Hadwen asked whether manure would become plant food sooner when on the surface or when ploughed in.

Prof. Atwater replied that manure acts in a great many different ways, and might sometimes become plant food sooner when applied to the surface, and sometimes when ploughed in. Well-cured manure, applied when in the proper condition, always works well. But when the fermentation goes too far, not only is much valuable material lost but what remains becomes changed more or less to inert forms. If the manure is to be fermented, the process should not be too rapid nor carried too far. Now if the manure is spread on the ground when it is fresh or partly cured, it will not ferment much; it will lose extremely little valuable material, and rains and melting snows will soak the material into the soil as fast as it is rendered available, and thus it will be saved. If allowed to stand in small heaps it is apt to ferment so much as to waste a good deal. You must have it where the roots feed, and this is mostly in the first six inches of the soil. If you can apply it a considerable time in advance, spread it on the surface; there will then be less loss than when put in even small heaps; but the rain and the snow will

wash the manure into the soil. Some loss would occur when spread on the soil if the ground was frozen.

Mr. Ware, referring to what Prof. Atwater had said of the tendency of manure to operate on the soil, asked if there was not something gained by mixing fermenting material with plant food which does not ferment, as, for instance, stable manure or glue refuse with meadow muck.

Prof. Atwater said that he should answer to Mr. Ware's question, most emphatically, yes. With all our science we find our scientific knowledge most valuable when it leads us back to the simple processes which nature produces. Nature provides processes of fermentation and decay by which highly organized animal and vegetable matters are decomposed and brought into simple forms, in which they can be used by the plant. Some samples of meadow muck are richer in plant food than any manure except the very best. These produce no effect in their natural condition, but by drying, decay, and fermentation, the bad qualities are removed and the good brought out. There is a great deal of difference in the quality of different deposits of muck and peat. In composting we should use materials which will aid the work of decomposition, and at the same time supply plant food, such as lime, plaster, or potash in its cheapest form. These will change useless, or worse than useless, materials into valuable forms. It is better to mix several materials; a mixture does more good than a single ingredient.

Mr. Moore said that many years ago he made himself believe in compost, but his crops said it was a fraud. Some peat is so full of sulphate of iron as to be injurious to plants. Farmers make a compost heap on the land, but how can you compost manure better than by ploughing it in?

Prof. Atwater assented to the last point made by Mr. Moore, as regards manure, but asked, Suppose you have a good muck bed in the back pasture, but cold and wet; will it not be profitable to dig it out, dry it, cart it to the barn, and compost it? The quantity of plant food in muck is very variable; he had looked at one bed and advised not to use it, but beds composed of decayed leaves and branches are very valuable, sometimes containing more nitrogen than barnyard manure.

Mr. Wetherell said that we wanted to use soil or muck as an absorbent, but he knew of a farmer who had got tired of carting the soil of his fields to his barnyard and then carting it back again.

Prof. Atwater said that many samples of fertilizers came to him for examination, and that many farmers pay too much for them, because they fail to discriminate not merely between good and bad, but between those which are most appropriate to their soils, and those which are not.

Prof. Atwater's lecture was illustrated by specimens of fertilizers, and by diagrams of Dr. Nobbes' experiments with plants in solutions, and of experiments made by the lecturer in barren sand, and by tabular views of the experiments made under the direction of the Connecticut Experiment Station. It was listened to with great interest throughout, and at the close Mr. Moore moved a vote of thanks to Prof. Atwater for his able and instructive address, which was unanimously passed.

MEETING FOR DISCUSSION.

SATURDAY, February 16, 1878.

A meeting for discussion was holden at 11 o'clock, W. C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The discussion was a continuation of that of last week on Fertilizers.

Dr. E. Lewis Sturtevant opened the discussion. He had had no time to prepare a paper, but said that he had carefully considered the subject, and that the facts he should present would be correct, and the opinions given such as he had deliberately formed.

He referred first to the history of fertilizers, and claimed that a substance had been extensively used during ages, and had, on the average, always produced crop-results. This substance was dung. In 1840, Liebig first brought the subject of artificial fertilizers vividly before the public, in his masterly writings, and his views had received such currency that their few errors had become difficult to eradicate from the public comprehension. He, however, proved one true and important fact: that the elements of the plant were taken as such from the soil, and that plants could receive into their structure mineral food artificially supplied. Hon.

J. B. Lawes, of England, in his series of experiments covering thirty-four years with the same crop under similar conditions, has shown that artificial fertilizers or chemicals are the equivalents of dung, and Ville, of France, has, in like manner, confirmed and added to this conclusion. In addition to their scientific value, Mr. Lawes' experiments have shown the reliability of a mixture of fertilizers in producing crops, and he has stated, as the result of his long experience, that under certain circumstances he should give the preference to a chemical over an animal fertilizer like yard manure.

Dr. Sturtevant said we may claim, also, from experimental evidence, largely negative in its character, that a complete fertilizer is the equivalent in crop-producing capacity to dung, while the theory of Ville, that the farmer can cause the plant to analyze the soil, and determine the needs of the soil, has received no confirmation in practice. Dr. Sturtevant therefore claimed with considerable positiveness, that the plan of applying single fertilizers to limited areas for a single year, is unworthy the attention of the practical farmer, as having never been productive of information in regard to the cropping condition of the land in the past, and as not promising anything at present. An application of a single fertilizer may, however, in the hands of a trained observer, offer valuable information, but it is incapable of analyzing a field and showing its deficiencies, until in some way—an impossible thing at present—we are assured that the field is of a uniform composition, a uniform physical state, and the crops planted are all treated in a uniform manner during growth, originating from seed of uniform heredity, and special hereditary characteristics.

He said that the great difference between the single and the complete fertilizer was in their relation to each farmer's practice. That the single fertilizer might advantageously supplement dung, while the complete fertilizer can replace dung. That the farmer who uses a complete fertilizer secures the same certainty as if using dung, while the farmer who uses a single fertilizer secures favorable or unfavorable results according to the condition of the land in reference to past supply of plant food. If we know our land is deficient in one element, then we should apply this element. But we cannot know this, as there are continual changes occurring in the land, and it is but the available plant food which concerns us as farmers, and not that in an inert state, so far as regards this question.

Benjamin P. Ware understood that Dr. Sturtevant had expressed the opinion that it would be profitable to sell barnyard manure and purchase chemical fertilizers, and asked whether he was still of that opinion.

Dr. Sturtevant replied that it was but a question of price. When the price of dung is relatively higher than that of fertilizer, then he was ready to sell. At the present time he would sell dung at eight dollars a cord, for this was more than its chemical value, and he could secure larger returns in crops from the eight dollars invested in fertilizer than from the cord of dung.

At the present time, Stockbridge's idea is undergoing trial, and the experience of several years has been confirmatory of its real value. The speaker could say, and would say, that the Stockbridge formula offered a substitute for dung which enabled him to cultivate all the land he pleased, and which, at present prices of fertilizer and product, left a handsome margin of profit. The Stockbridge formula was certainly a more philosophical method of obtaining results than the Ville formula, as being based on the wants of the plant, in preference to being based on the accidental product, dung.

In the national characteristics of the Germans, we recognize a thoroughness of agricultural thought which is commendable, but in agriculture the Germans show little power of generalization. In England, the farmers have been taught empirically, through experience, the value of artificial fertilizers, and, as a consequence, there is more of fertilizing material imported into that country than into any other portion of the world of the same area. The American farmer — the intelligent one — is more of a scientific farmer than the English farmer, and endeavors to use the results of investigation as generalized to meet his case; and hence new ideas of fertilization find an extended welcome, and receive more careful and unprejudiced trial than elsewhere.

In response to a question, Dr. Sturtevant stated that Messrs. Prout and Middlemarch, of England, had farmed extensively, using fertilizers as directed by Dr. Voelcker, and the results were unquestionably successful.

He added that fertilizer experiments are often vitiated by the failure to consider the importance of seed, and, as an illustration, that if we have two seed corns, one of the normal productiveness of thirty bushels per acre, and another of sixty bushels, and plant

this seed on land of a fair agricultural condition, the fertilizer will not cause the thirty bushel variety to as readily respond as it will the sixty bushel variety. In other words, it is as easy to grow the sixty bushels in one case as the thirty bushels in the other; and hence, unless this difference of productive capacity be considered, we cannot fairly measure the apparent effect of the plant food applied to the soil. In land of sufficient fertility to mature a thirty bushel crop with either seed, an application sufficient to cause the better variety to yield sixty bushels, will probably not cause the thirty bushel variety to harvest over forty bushels. He repeated, however, that in order to test these differences even, the trial must be on a sufficiently large scale, and, preferably, continued over a series of years.

The speaker considered Southern New Hampshire and Vermont, with Massachusetts and Connecticut, the most profitable farming region in America. With fair land and most excellent markets, this locality offered rewards for the application of intelligent thought to the farmer. As soon as the New England farmer learns that the amount of his cultivated land is not limited by his dung-heap, but by his capital, then shall we find agriculture the most desirable of occupations. New England cultivates too little land to a farm, for profit. The complete fertilizer allows us to extend our operations within the lines of profit to the full capacity of the farm. The duty of the farmer is to have faith in the teachings of science, and then to consider whether the teaching meets his case, and whether he can afford to practise it. Fertilizers will benefit any crop and any of our land. The farmer is to consider the cost to him of this benefit, and whether he can afford to pay for it.

H. Weld Fuller had been brought up to believe that barnyard manures have a duration vastly longer than that of chemicals; the German chemists say its effects are felt for eighteen years. The last speaker would use, on all soils, however various, one single specific. No matter how *over*much of any ingredient may be in the soil, it must still have as much more of the same added as the intended crop will contain.

Now, why should a man apply phosphates to his land when there is already in the soil more than enough for a hundred years to come? An excess of any salt when added to a soil may do mischief. This will often be shown by a deposit of a fine powder on the leaves of plants, this being an excess which the plant cannot assimilate.

Are the experiments of the Germans of no value? When the same product has been raised on a piece of land for a hundred years, and a constant supply of the needed ingredients is produced by nature, would you add what the soil already holds in excess? Stockbridge assumes that all soils are alike, and that all are barren, and supplies all he expects to reap. This seemed to the speaker to be a waste of money and material, and to be radically wrong. England has more moisture than we, and experiments there may differ from our own. But he regarded anything which tends to induce our farmers to lessen their stock or to undervalue barnyard manure, as a mistake.

Dr. Sturtevant said that he was willing to put himself on record as to the scientific question of the complete fertilizer being a substitute for dung, but that this was not the whole question by any means for the farmer to consider. There was something in the application of a scientific truth. Each country has a different climate, and the fields receive different treatment. Would we advocate the German average crop of wheat, of twelve bushels per acre, or the English average crop of twenty-five? We surely should not claim the one as the exponent of German science and the other as the exponent of English empirical practice. Yet the farmer who applies the teachings of science in the manner recommended by an honest experience, obtains yields far in excess of the mere imitator. The farmer must consider the *why* of a process, and then, if satisfied that the *why* is correctly apprehended, put his learning to a practical application.

In considering chemical fertilizers, the speaker first noted that his own experience, and that obtained from books, offered no evidence against the certainty and reliability of action of chemicals when properly applied. The presence of certain elements of plant food in excess, influences the physiological condition of the plant, and hence affects the crop. We must then see to it that this influence is in the direction of profit to us. Plants in a dung heap or a barren soil may be equally barren of fruit; superphosphate strewn on the side of a hill of corn, will cause the plant to develop more fibrous roots on that side, and hence make the plant thus situated a grosser feeder, and more capable of securing the plant food already in the soil; on old land, formerly dunged but now run out, an unneeded plant food, like salt, will oftentimes release fertility from the soil, or put the plant into a condition to secure supplies

which it otherwise could not do, and hence may act as a fertilizer, but indirectly. These diverse conditions of land, of season, and of crop, all complicate the subject, and offer sources for error in interpretation, so that, notwithstanding the differences of opinion among farmers as to the usefulness of applications, we are satisfied from the few cases where simple causes have been eliminated from the mass of possibilities and stated, that chemicals do offer a substitute for dung to fertilize our fields, and that it is the fault of the farmer alone if he use them unprofitably.

Leander Wetherell asked Dr. Sturtevant for a detailed account of his experiments. Could he bring a case where stable manure has been used continuously for a long series of years without improving the soil? Or could he give a case where chemicals have been thus used, where the fertility of the soil has been kept up and improved? He thought the doctor manifestly undervalued the reported results of the German Experiment Stations. Prof. Johnson, the Director of the Connecticut Experiment Station at New Haven, Mr. Wetherell said, incorporated into his valuable book, "How Crops Grow," the tables of Prof. Wolff, of the Royal Academy of Agriculture, at Hohenheim, Wurtemberg. The speaker doubted whether Lawes and Gilbert's experiments, if repeated here, would produce the same results as reported on their farm at Rothamstead. He was slow to believe that three specifics, nitrogen, phosphoric acid, and potash, for example, make a universally complete manure in all places and for all time. Some soils are hungry for phosphoric acid, and have an abundance of potash; why use potash where it is not needed? The same may be true of nitrogen. Let farmers and gardeners interrogate their soil with reference to these chemicals and use what is needed, and not subject themselves to the expense of purchasing what the soil already contains an abundance of in a soluble condition. He believed in experimenting.

Dr. Sturtevant said that his remarks had been rightly understood. The German experiments are the most valuable we have, and are thoroughly trustworthy, but he took the liberty of not deferring to authority when he knew better himself. He did not think the experiments described last week would bear out the interpretation given them.

Mr. Fuller asked, if the straw and vegetable matter from the barnyard were of no account, how we could enrich soils by turning in green crops, as sometimes practised.

Dr. Sturtevant replied that we put back more than we have taken from the soil. The only plant food is the inorganic elements and the nitrogen, and these are conserved from the soil by a green crop, and we can consider green manuring somewhat in the light of a fallow.

Mr. Fuller said we do not admit that a grown plant has less nutritious matter than a growing plant.

Dr. Sturtevant said that straw contains a certain proportion of ash element and nitrogen.

Mr. Fuller asked if there is not more ash in a grown plant than in an immature one.

Dr. Sturtevant replied, yes and no. Much of the ash element is not essential. Straw takes up much silica; it can be taken up in excess. Organic matter is not plant food.

N. B. White, had known many failures of crops in time of drought from using dung. It was so in Minnesota last year. He thought that the place for chemicals; he had seen many instances in the west where stable manure dried up, instead of decomposing, and the crop was poorer than if no dung had been applied.

James Cruickshanks said that he had made eighty bushels of corn to the acre with barnyard manure.

Dr. Sturtevant said that he could refer to a crop of one hundred and twenty-three bushels raised with chemicals. He did not wish to underrate barnyard manure, but simply said that the chemicals in it can be supplied as well in fertilizers. He did not wish to draw a comparison between barnyard manure and fertilizers. The province of fertilizers, if a single element, like superphosphate or potassa, is to supplement or add to the dung. The complete fertilizer is to be used when we are out of dung, and wish to till additional land. In some cases the organic matter in dung will give it an advantage, but this opens up other considerations than those which we are discussing.

Marshall P. Wilder said that all would agree that manure does contain the ingredients which have been spoken of as essential to the food of plants, and he thought that Dr. Sturtevant had placed the matter very fairly. The practical question is, What kind of manure shall we use? He had always held to making a perfect and thorough trial, for we have not practical knowledge enough. Mr. Wilder related an instance where he directed a man to apply a fertilizer to a plot of celery, and he put a whole bag on one row

and killed it. That was an experiment that taught something — it showed that a less quantity was sufficient. It is a simple matter to lay out a piece of land in strips, and apply a fertilizer for a series of years. He was delighted to hear Dr. Sturtevant say that farming is more profitable in New England than anywhere else in this country, and this view is confirmed by the statistics gathered by the Secretary of the Massachusetts Board of Agriculture, and published in his "Report." It also finds an illustration in the "Transactions" of the Worcester County Horticultural Society, from which it appears that there were raised in that county, in 1874, 933,000 bushels of apples, valued at $380,000, and that in 1875 one of the members of that society realized from about three acres of strawberries, mainly in a gross income of more than $2,000. Farming in New England can be made profitable, but not without manure.

Mr. Fuller said, that if you always returned to the soil all you took from it you would not thereby avail much, or gain matter from what the ground had in reserve for you before. It would be better, he thought, to ascertain what was needed and add *that* only; and not give all the ingredients of an intended crop.

Mr. Wetherell spoke of the experiments made on the experimental ground of the Cirencester Agricultural College, and reported by Prof. Wrightson, relative to the use of superphosphate, stating that three hundred pounds of ordinary mineral superphosphate per acre gave the most profitable results, it doing best when half of it was drilled in and the other half broadcasted. In the experimenting four hundred pounds and six hundred pounds were applied, the latter quantity in some cases giving no larger crops than three hundred pounds, and in others a little more, but not enough to pay the additional cost, even when three hundred pounds were drilled in and three hundred pounds broadcasted. The speaker quoted Lawes as saying that forty-eight bushels of barley per acre was his best average crop: higher manuring caused it to "run to straw," as farmers phrase it. Every crop has its limit, beyond which it is not economical to endeavor to increase the crop. While he did not doubt that one hundred bushels of corn had been grown upon an acre, he did doubt the possibility of two hundred bushels and upwards per acre. Lawes seemed to succeed in cropping, regardless of rotation. Why not use a rotation of manures, and thus avoid the rotation of crops so generally recommended and practised by

farmers? If the percentage of real chemicals in stable manure be so small as Lawes and Voelcker show, then why not use the former and save the labor of shovelling and hauling the bulk and great weight of the latter?

Mr. Wilder asked if we do not obtain better results from fertilizers in wet seasons than in dry.

Mr. Wetherell replied that we do, adding that the same is true of stable manure. Farmers in Western Massachusetts had paid fifteen dollars per cord and upwards for stable manure.

Mr. Wilder remarked that the idea that we can analyze crops and manures and ascertain what are adapted to each other is sound in principle, but does not always work well in practice.

Dr. Sturtevant spoke of the danger of drawing general conclusions from limited experiments. It does not follow from Mr. Lawes' experiments that it would be proper to act upon his practice in other cases. Hay takes up much water, and land which will not give half a ton of hay may give sixty bushels of corn per acre. The water supply is often as essential to be considered as the dung supply. Lawes has found, but does not pretend to explain it, that nitrate of soda increases the quantity of moisture in the soil.

Mr. Fuller asked whether it produced that effect continuously for several years, and remarked that forcing was always a weakening process.

Dr. Sturtevant said that in twenty-six experimental crops, the first twelve years averaged twenty-four bushels; the second twelve years showed an increase, with complete fertilizers. From a theoretical point of view we have exhausted some element. The prejudice against artificial fertilizers has come from the application of special ingredients. Can a man afford to neglect insurance? When we apply a complete fertilizer we are getting certainty, which may be considered in the light of insurance.

The Chairman announced that the subject would be continued on the next Saturday.

MEETING FOR DISCUSSION.

SATURDAY, February 23, 1878.

A meeting for discussion was holden at 11 o'clock, President Gray in the chair. Before the subject of Fertilizers, which was the special assignment for the meeting, was taken up, W. C. Strong, Chairman of the Committee on Discussion, remarked that discussions which elicited interesting and valuable information had often been suggested by the articles presented for exhibition, and called on James Comley to say something of some fine new roses exhibited by him.

Mr. Comley spoke particularly of the Souvenir d' Arthur de Sansal rose, the plant of which was grafted in August, 1876, and put in the greenhouse on the 24th of December. He had used a solution of saltpetre for watering both the roots and foliage of his roses; dissolving a piece as large as a walnut in four gallons of water. He thought this the best fertilizer he had ever used for watering roses, and it obviates, to a great extent, the necessity of smoking, which takes the color out of roses. He thought water should be of the same temperature as the air of the house; he believed that more roses were killed by cold water than in any other way. He would not give much water for three weeks after bringing into the house. Growers are too apt to neglect their plants after forcing; care should be given, as with a grapevine, that the wood becomes hard and well ripened. If single specimen flowers are wanted they should be pruned long; if clusters are desired they should be pruned closely. Mr. Comley said that while many growers thought only of the money to be made on their roses, he cultivated them partly from the love of them. Many roses that are very beautiful are not profitable. Many of the new French roses are not as good as the English varieties. Some of the new kinds will surpass the old ones in freeness of flowering, which is a most important point, and in color. He would first see to the growth of the plants, and make them grow as much as he could before the first of June, and after that would plunge them out of doors. He thought as good roses could be produced in eight weeks after bringing the plants into the house, as in a longer time. He has a plant of Sir Garnet

Wolseley, which made eight shoots, averaging twelve feet in length, and expects that next year it will be a splendid specimen. It is probably on the Prince's stock, which he prefers to the Manetti. In England they grow too coarsely out of doors on this stock. Mr. Prince grows the best roses in England; his stock is only a selected Dog rose. Instead of collecting old Dog roses from the hedges he sows the seed and grafts the seedlings when they are one year old. The grafts grow more vigorously than on other stocks, and healthy stocks do not send up suckers. The speaker would never plant Hybrid Perpetual roses on their own roots, either for forcing or for out-door culture. He planted a bed of roses for Mr. Merriam, of Lexington, in common garden soil, spaded about twelve inches deep, which produced some of the finest roses he had ever seen. These were on the Prince's stock. Mr. Comley said that he would prefer perfect medium sized roses to those almost as large as cabbages. In applying manure he would keep it near the surface, so as to attract the roots where they would have the benefit of the sun and air. He thought we have among our wild roses as good a stock as Prince's; it makes many fibrous roots. He had saved half a bushel of the seed. For forcing he thought a plant on the Prince's stock better worth a dollar, than one on the Manetti is worth twenty-five cents. There is great risk in forcing new roses; he has four kinds out of thirty-six which have not a single flower. Their hardiness is also uncertain. He would not care if it took half a day to cover up a fine rose. We lose a great many beautiful things because they will not take care of themselves. Mr. Comley gave the following list of roses, which he considered the best new varieties: Abel Carrière, Duchesse Amélie, Duchesse de Vallombrosa, Jean Liabaud, Jean Soupert, John Fraser, John Stuart Mill, Madame Auguste Revilliod, Mademoiselle Émilie Verdier, Rev. J. B. M. Camm, Royal Standard, Souvenir d' Arthur de Sansal, Souvenir de Louis Van Houtte.

M. H. Merriam corroborated what Mr. Comley had said about his roses. He had never seen the equal, for abundance, of the best crops of flowers, and it has been well maintained. They have received the approving awards of the Society. He was never troubled with suckers until the last season, and perhaps their appearance then was owing to not giving sufficient care to the grafts. The *sine qua non* in forcing roses is an abundance of well ripened wood. Mr. Merriam said that he had corresponded with

Professor Stockbridge in relation to special fertilizers for roses, was of opinion that the use of iron in some form is desirable. He had seen fugitive paragraphs recommending its use. Whatever the color of roses there is always a notable presence of iron in the flowers. It also gives vigor to the growth and color to the foliage. He believed, also, that the exhalations from ammonia, placed on the pipes in the greenhouse, were advantageous.

The subject of "Fertilizers," assigned for this meeting, was then taken up, and John B. Moore was called on as a cultivator who, whether he showed a rose, a strawberry, or a grape, had evidently given it something to eat which it liked.

Mr. Moore said that the question how to get manure is the most important one which farmers and gardeners have to meet today. We can grow crops if we can get manure, but the manure must not cost more than the crops. There is a difference of opinion among cultivators as to stable manure and chemical fertilizers. Some say "we will use only manure," meaning animal excrements, and some say "we will use only chemical fertilizers." In the view of the speaker both classes were wrong. He believed that every farmer should save all the dung and other waste of the farm for manure, and buy all that his means would allow. But this source of manure is soon exhausted, yet the farmer finds the wants of his land unsupplied, and he must have something more. From his own experience and from the study of scientific books an intelligent farmer will come to the conclusion that each crop must have some special fertilizer. There is no doubt that certain crops require a larger amount of some particular element than is supplied by stable manure. Onions, for instance, require a large quantity of potash, as is shown not only by chemical analysis, but by the fact that there is no better fertilizer for onions than wood ashes. They also require sulphur, and this and the potash may be conveniently applied in the form of sulphate of potash. The speaker advised farmers, instead of buying mixed fertilizers, of the genuineness of which they could not tell anything, to buy the particular articles which their crops need. Dealers say "If you will apply the complete fertilizer you will be all right," but they know nothing of the various soils to which it is to be applied, and are like a physician attempting to prescribe for a patient fifty miles away. Farmers should not leave it to other men to tell them what they should themselves know

about their land. They must use their own brains, and, while not relying on chemists, should avail themselves of their labors. Chemists can tell what is good for crops, but they cannot tell as well as the farmer, what his soil needs. It is an impossibility to make an analysis of a soil which shall be of value to a farmer; a soil may show, by chemical analysis, much potash when there is none in a form available for plant food. It does not require a great deal of knowledge or a great deal of time for a farmer to post himself up by study of the analyses of crops by Professor Goessman, or of other analyses which he will find in chemical works, so that he can buy understandingly all the simple elements that he needs, and apply them to his crops. The farmers must use barnyard manure as the basis of the plant food for all their crops, and then apply the particular element required by any crop in greater amount than is needed for other crops, or than is supplied by barnyard manure. They must use their own brains, and study their own soils.

N. B. White said that Prof. Atwater's advice to farmers not to use complete fertilizers, but to experiment and ascertain the needs of their soils, reminded him of the mother who would not let her boy go into the water until he had learned to swim. Farmers cannot wait to find out about their soils by experiment. Mr. White believed that none of the soils in New England had an excess of any of the elements of plant food, and therefore thought well of complete fertilizers.

The Chairman of the Committee on Discussion announced that as next Saturday was prize day for Hybrid Perpetual Roses, the subject of forcing roses would be again discussed.

BUSINESS MEETING.

SATURDAY, March 2, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, President Gray in the chair.

The Secretary read a letter from John G. Barker, resigning his position as Chairman and member of the Committee on Plants and

Flowers. On motion of Hervey Davis it was voted that the resignation be accepted.

On motion of John C. Hovey, it was unanimously

Resolved, That the thanks of this Society be extended to J. G. Barker, for his long and faithful services as member and Chairman of the Flower Committee.

It was moved by William C. Strong that the polls be opened for twenty minutes for the reception of votes for a member to fill the vacancy caused by the resignation of Mr. Barker. E. H. Hitchings moved to amend this motion so as to provide for the choice of a member of the Flower Committee. The Secretary stated the usage in similar cases, and the motion, as amended, was carried.

On motion of W. C. Strong, it was voted that the Committee on Plants and Flowers be empowered to elect a chairman.

The President appointed John C. Hovey, W. C. Strong, and E. H. Hitchings, a Committee to receive, assort, and count the votes for a member of the Flower Committee. Mr. Hovey declined, and E. W. Buswell was appointed in his place. The polls were opened at fifteen minutes past eleven.

On motion of W. C. Strong, it was

Voted, That the Recording Secretary be directed to place on record the Report of the Committee to procure a site for a new Hall, presented February 7, 1863, and also the letter from E. S. Rand, Sr., accompanying said report.

W. C. Strong, Chairman of the Committee to present a Testimonial to Ex-President Parkman, reported that the Committee had procured and presented to Mr Parkman three crayon photographs, as an expression of the Society's appreciation of his services as President. In this connection Mr. Strong spoke of the high estimation in which the hybrid lily raised by Mr. Parkman, and bearing his name, is held in England, as evinced by the large remittances received from the English nurseryman to whom the bulbs were entrusted for propagation.

Marshall P. Wilder expressed his gratification that Mr. Parkman had, by the application of scientific principles, been able to produce such a lily, which he deemed a great credit to the Society as well as to Ex-President Parkman.

Mr. Wilder said that having worked with the Society for nearly

fifty years, and being desirous of leaving some footprints on the sands, he had collected his addresses and other writings, from 1848 to 1877, and caused them to be bound into a volume, which he presented to the Society, in the hope that it might cause him to be remembered with affectionate regard when he should have passed from the stage. He also presented a Wilder Medal of the American Pomological Society, bearing his own likeness and the beautiful wreath of fruits and flowers, designed by John J. Thomas, the eminent pomologist, and said that the American Pomological Society, now extending over the whole country, was formed at the instance of the Massachusetts Horticultural Society.

William C. Strong expressed his gratification that Mr. Wilder had collected these addresses in a permanent form, and moved a vote of thanks to this old and steadfast friend of the Society for the volume and medal.

Rev. A. B. Muzzey seconded Mr. Strong's motion. He looked on Mr. Wilder as the representative of our work, not only in a State but in a National point of view, and said it was not likely that we should often have an opportunity to recognize such a long, active, and honorable life in the service of horticulture.

President Gray, in putting the question on the motion offered by Mr. Strong, took occasion to express his appreciation of the value to the Society, and to horticulture generally, of the services rendered by Mr. Wilder in the long and active life commemorated by the documents and medal. The vote of thanks was unanimously passed.

The President read the following communication received by him :

The undersigned, interested in advancing a practical taste for Floriculture, especially among the children of the laboring classes, desire that the Massachusetts Horticultural Society shall offer prizes for Window Gardening, and conduct all the business of advertising, exhibiting, and awarding prizes, necessary to insure success.

RUFUS ELLIS,
HENRY W. FOOTE,
C. A. BARTOL.

The President stated that the measure would involve no expense to the Society. It was

Voted, That the Flower Committee, with Mrs. J. W. Wolcott,

Mrs. C. N. S. Horner, and Mrs. E. M. Gill, be a Special Committee to fix and award prizes for Window Gardening, agreeably to the above communication, and to conduct all the business necessary to insure the success of the object therein proposed.

The polls for the election of a member of the Flower Committee were closed at twenty-five minutes before twelve, and the Committee to receive and count the votes reported as follows:

Whole number of votes,	104
Henry Ross had	75

and was declared elected a member of the Flower Committee.

Meeting dissolved.

It was intended to hold a meeting for the discussion of Rose Culture at the close of the business meeting, but so much time having been consumed by the unusual amount of business, and the principal rose-growers being more interested in the beautiful exhibition in the Hall than in the discussion, it was postponed until the next Saturday.

MEETING FOR DISCUSSION.

SATURDAY, March 9, 1878.

A meeting for discussion was holden at 11 o'clock, President Gray in the chair. Subject, Rose Culture.

William C. Strong alluded to the remarks made by James Comley at the previous meeting concerning stocks for roses, and especially the Prince's stock. These remarks suggested an inquiry as to the cause of the diseased condition of the Maréchal Niel rose, when budded on other stocks, particularly the Manetti, the wood swelling and cracking. This raised the question as to the proper stock for that rose, and opened the whole subject of the mutual influence of the stock and graft. The influence of the graft on the stock is plainly shown in the abutilon. The speaker had budded the *Abutilon vexillarium pictum* on the plain type, and the bud so inoculated the stock that a shoot springing out several feet below the graft was variegated, though showing the type of the large

leaf. The wood of the Manetti is so different from that of the Maréchal Niel, that it is unfit for a stock for that variety. We should seek for stocks similar in texture to the graft. The Laure Davoust he thought well suited for a stock for tender roses.

Mr. Strong recurred to the subject of the mutual influence of stock and graft, and said that it was of great interest to all cultivators. Much disappointment had been experienced in the use of the quince as a stock for the pear; it is not as hardy as is desirable, is subject to the borer, and requires a rich soil. Mr. Strong had been engaged in the culture of the *Cydonia Japonica* for hedge purposes, and was led to consider its fitness as a stock for the pear. It is thought by botanists to be more closely allied to the pear than is the common quince, being sometimes placed in the genus *Pyrus*. When grown for hedges or ornament it is propagated by cuttings of the root, and forms irregular bushes, with many suckers; but when grown from seed it makes clean, handsome plants. It is not a free fruiting plant, but the speaker was fortunate in obtaining a sufficient quantity of the seed to raise fifteen thousand plants, which averaged two feet in height the first season, but were not as stocky as pear seedlings. A small quantity of *Cydonia Japonica* seedlings were budded last summer with pears, which took perfectly, and the buds look as well this spring as those on the pear. The indications are so favorable that Mr. Strong was encouraged to hope that this is destined to become a valuable stock for dwarf culture of the pear. For the purpose of proving this question he has planted out two acres of stocks for budding this summer. The Bartlett pear does not succeed on the quince, for the same reason that the Maréchal Niel does not succeed on the Manetti stock—the difference in the texture of the wood. The late John Fisk Allen, who exhibited very large Seckel pears, believed that their size was increased by grafting on large fruited varieties, like the Beurre Diel. Roses on Manetti stocks produce larger flowers than those ou their own roots, except very strong growing kinds. In answer to an inquiry by Marshall P. Wilder, Mr. Strong said that he had not observed any other plant than the abutilon where the stock was inoculated by the scion.

Mr. Wilder said that the influence of the variegated abutilon on the stock had been noticed in Europe, but that it was not always certain. He had tried the experiment himself, and all the shoots from the stock came without variegations. There is no doubt that

it is desirable to have an affinity between the stock and scion, but the subject is little understood. He believed that the character of the cellular tissue of wood had an influence on the graft, and that when the texture of the scion and stock did not agree they would not succeed. There are some pears, such as the Cross, which seem to kill every stock they are grafted on. He had had two vigorous Doyenne Boussock trees killed by grafting with Cross; it seems to poison them. At present we can only ascertain by experiment whether a scion and stock are suited to each other, but the instances mentioned are sufficient to show that there is an influence of the scion on the stock, as well as of the stock on the scion. The Beurre Bosc pear makes long roots, but when grafted on other kinds it produces a mass of fibrous roots.

Mr. Strong remarked that the Cross pear would not kill the stock if suckers were allowed to grow.

President Gray said that there is no doubt that variegated pelargoniums, when grafted on plain kinds, sometimes cause the stock to send out variegated shoots. The best plant of Maréchal Niel that he had ever seen was on the Lamarque stock, and was probably double-worked. He alluded to Mr. Strong's statement that the seedling plants of *Cydonia Japonica* are far more vigorous than those raised from cuttings, and said that the Prince's stock for roses was simply a Dog rose raised from seed, by which a new plant, from top to bottom was obtained. Plants grafted on it grow well for two or three years, without suckers, and should be planted deep enough for the graft to make its own roots. For two or three years you get better roses from the Manetti; by that time they have made their own roots. In England every rose is grafted on the stock which experience has proved best adapted for it, and hence in a lot of imported roses we find a variety of stocks.

Mr. Wilder said, in reply to an inquiry by Mr. Strong, that the Manetti rose had flowered and produced seed in his grounds. It has a semi-double flower.

President Gray alluded to Mr. Comley's statement at the previous meeting, that he had saved seed from a brier growing in a swamp. He would prefer seed from a plant growing in a well drained place, to raise stocks for budding roses on.

Mr. Strong asked if any one had had experience in the use of our native Dog rose as a stock.

Mr. Wilder wished to know whether stocks procured in the fields could be relied on as being all of the same variety.

Mr. Strong thought that though roses sport when grown from seed, they could be relied on as stocks. At Mr. Wood's place, in Natick, he saw two fine plants of Maréchal Niel said to be on Dog rose stocks, but he thought they were not adapted to this variety.

C. M. Atkinson endorsed everything that the President had said. The Prince's stock is not as distinct as the Manetti; it is nothing but the English Dog rose raised from seed. The wide hedges of weeds, brambles, etc., from which roses for stocks were formerly procured in England, are now being removed and wire fences substituted. Consequently Dog roses are getting scarce, and Mr. Prince, who is a nurseryman, seeing this, has gathered the hips and grown them from seed, producing a better stock than the wild ones formerly collected, but it is not adapted to weak growing kinds. It is necessary to ascertain by trial what stock is adapted to each variety. Some kinds will not throw out roots from the grafts, but most will after twelve months. He did not want a kind that would not root from the graft. In his opinion the Dog rose requires too long a state of rest to be adapted for a stock for tender roses for house culture. Laure Davoust, Lamarque, and Solfaterre are better, and the Banksian is best of all. He did not think the Dog rose of this country worthy of consideration as a stock; the wood is small and wiry and the bark hard.

Mr. Strong dissented from Mr. Atkinson on the last point. He thought our Dog rose quite as strong as the English. He could show Mr. Atkinson hundreds of specimens that he would have to look up to.

President Gray said that nobody takes proper care of roses on their own roots. They will take a great deal more feeding than grafted roses. He did not think weak growing kinds worth cultivating.

Robert Murray had never been able to make a bud grow on the native rose.

M. H. Merriam thought that in cases of variegation the affinity between the stock and scion is very close, and this goes to strengthen the point urged here of the desirableness of such affinity. His roses are all grafted on the Prince's stock, and he believed that with weak growing varieties the stock would assert its pre-eminence, and must be very closely watched. He had lost many by neglect, but the strong growing kinds are as good as ever. He thought none had got on their own roots, though planted sufficiently long.

Mr. Strong agreed with the President that for general purposes it is better to have roses on their own roots, but for the florist would have some kinds on Manetti or other stock of vigorous growth. The roots will absorb more water and endure more variations.

President Gray said that in his previous remarks he referred only to out-door roses.

Mr. Strong, as Chairman of the Committee on Publication and Discussion, announced that Part II of the TRANSACTIONS of the Society for 1877 was ready, and could be had on application to the Secretary, and that on the next Saturday the subject for discussion would be the Culture of Small Fruits.

MEETING FOR DISCUSSION.

SATURDAY, March 16, 1878.

A meeting for Discussion was holden at 11 o'clock, W. C. Strong, Chairman of the Committee on Publication and Discussion, in the chair.

The subject assigned, the Culture of Small Fruits, was opened by A. D. Capen, who spoke particularly of the strawberry, and remarked on the necessity of constant care and watchfulness on the part of those who attempted the cultivation of this fruit, and on the importance of novices' learning all they could from the experience of others. Mr. Capen spoke of the great difference in the results with the same variety in different locations, and instanced the north and south sides of Charles River. He could not do anything with the Hovey's Seedling, but succeeded with the Charles Downing. His great difficulty had been in feeding his plants; he had got too much foliage. The Charles Downing was in season for a long time with him, beginning to ripen earlier and continuing later than most kinds. He had had this variety with leaf stems fifteen inches long, and the fruit stems from ten to fourteen inches long, and standing more thickly than he had ever seen elsewhere. The crop was found to be from six to seven thousand quarts per acre.

The Chairman read from the last report of the Fruit Committee the following: "Much has been said in favor of the Monarch of the West, Star of the West, and the Great American, but we believe either of those raised by Mr. Moore is in all respects superior to any of them." He inquired whether the varieties named, and especially the Great American, were so well tested as to warrant the comparison.

Benjamin G. Smith, a member of the Fruit Committee, replied that the specimens exhibited were from plants set last spring.

The Chairman regretted the expression, and thought that we should be very careful in regard to giving opinions on fruits that we know little of.

E. P. Richardson was disposed to think the Monarch of the West better than was implied in the report of the Fruit Committee. One of his neighbors who has cultivated it with the Wilson, is inclined to substitute it for the Wilson as a market variety. The specimens shown at our exhibition were very large, but of poor color.

Mr. Smith said that he had given special attention to the culture of the currant and gooseberry. He found it impossible to produce the best results without vigorous foliage. He trenched and enriched his soil to the depth of from twenty-four to thirty-six inches. He mulched his gooseberries with salt hay, and used a solution of sulphur and lime to prevent mildew on the foreign varieties. He pruned very severely, shortening the young wood, excepting the terminal shoots, to one or two eyes. For strawberries he had used a compost of one-fourth hen manure and three-fourths leaf mould. He had found the Dorchester blackberry extremely liable to be winter-killed.

The Chairman remarked that the Wachuset Thornless blackberry had been highly recommended in Worcester county, and called on O. B. Hadwen, Ex-President of the Worcester County Horticultural Society, for information as to its character.

Mr. Hadwen had seen it under very favorable circumstances, and producing abundant crops. He had seen a row two hundred feet in length covered with a larger crop of fruit than he had ever seen on any other variety, wild or cultivated. It is perfectly hardy. It is grown largely by Thomas A. Dawson, of Worcester, and Mr. Hadwen had visited his grounds, and had never seen one winter-killed. Mr. Dawson's soil is a light loam. The Wachuset is not as large as the Kittatinny, but fully as large as the Dorches-

ter, and very good in quality. It should not be grown in the shade. Mr. Hadwen considered it perfectly hardy, and a promising variety.

Mr. Hadwen then spoke of the strawberry, which, he said, stands first on the list of small fruits, being the most acceptable berry to every one. Many varieties have had their day, and passed away. In Worcester county the Charles Downing is recommended as the best variety, where only one kind can be planted. It combines more virtues and has fewer defects than any other. It is productive, and acceptable in the family, and fair for the market. It adapts itself to a great variety of soils and adverse circumstances. The Wilson still stands first for market only.

Mr. Smith remarked that in Cambridge the Charles Downing succeeded on a sandy soil, but failed on clay, and asked Mr. Hadwen whether the case was the same in Worcester.

Mr. Hadwen replied that his soil is a stiff loam on a clay subsoil, and that the Charles Downing succeeds admirably in it.

J. S. Martin said that the Charles Downing succeeded well in his soil, which is sandy.

Mr. Hadwen went on to speak of the best time for planting strawberries, which, under ordinary circumstances, he considered the spring. It is not only better but cheaper to plant then. If neglected in spring it may be done in autumn, but if deferred until that time the plants must be taken up with balls of earth, put in rich ground, and watered. Market gardeners would not plant in autumn, for it would cost three times as much as in spring, and the risk of failure would be much greater.

Mr. Martin had planted in autumn and found no difference in the cost, and had never lost a plant.

Mrs. H. L. T. Wolcott had planted strawberries in summer, after taking off a crop of early peas. They bore well the next season, and a year's time was saved by fall planting.

The Chairman said that, owing to the greater care required, the cases of fall planting must be limited to a small extent. In the instance mentioned by Mrs. Wolcott, an important advantage was undoubtedly gained by fall planting.

Mr. Capen asked whether Mr. Hadwen would take up a ball of earth with his strawberry plants, if he were setting out an acre.

Mr. Hadwen did not suppose that any one would think of planting an acre of strawberries in autumn. Besides the disadvantages

previously mentioned, is the much greater danger of their being thrown out by frost than if planted in spring. In his remarks he had reference to Worcester county.

Mr. Capen spoke of a neighbor who planted an acre of strawberries with selected plants, drawing the roots through his hand, and setting in a hole made with a dibble, pouring in water at the same time. The speaker preferred not to use a trowel or dibble; he wanted the soil so thoroughly pulverized that he could set the plants with his hands. He had a man to precede the planter, and fork over that part of the ground where the rows would come, and called him back whenever he found a lump. He pulverized the soil between the rows with a plough afterwards. He wetted the roots of his plants before setting, and had had a better crop of Downing, Cutter, and Hooker, the first year, from plants set in May, than is often seen on beds set a year. He considered the middle of May early enough to plant strawberries, and would wait longer if it was very dry at that time. On plants set as late as the second of June he had had a fine crop the next year.

Mr. Hadwen was asked whether the statement in the "Transactions of the Worcester County Horticultural Society," that William H. Earle had received for the produce of three acres of land, a large proportion of which was strawberries, more than two thousand dollars, was correct. He replied that it was, and gave some account of Mr. Earle's method of cultivation. He plants in rows, three rows in a bed, the middle one being eighteen inches from each of the outer ones, and the plants twelve inches apart in the rows. He leaves a space of two feet between the beds, which are three feet wide. His land is favorably situated, at the base of a hill. He cultivates deeply, manures highly, and neglects nothing that will afford food to the plants. Late in autumn he mulches heavily with pine leaves, hay, or straw, and leaves the mulching on late in the spring, especially for late kinds, and even then the mulch is not wholly removed, but only a small space is opened over the crown of each plant, a portion of the mulch being left between the rows. In this way the fruit is kept clean, and always presents a bright, attractive appearance. He sets out his plants in the spring, allows no weeds, and does not cultivate until the crop has been gathered. He cultivates by hand, using an implement with a wheel. He gives the plants a great deal of water. Mr. Hadwen added that the best results in strawberry culture could not be attained

without great care, but it pays. Strawberries will not endure neglect.

Marshall P. Wilder, alluding to the statement that Mr. Earle gives his plants a great deal of water, spoke of the remark made by John B. Moore at one of these meetings, that he turned the Concord water-works on to his beds, until they were so wet that the foot sank in six inches in walking over them. Mr. Wilder also reaffirmed a statement of his own, quoted by Mr. Earle in his essay in the Worcester Report, that the first, second, and third things in strawberry culture were water, more water, and still more water, during the growing season.

Mr. Capen said that in strawberry culture, as with many other pursuits, we hear of the successes, but not of the failures, and he thought Mr. Earle's success an exception to the general rule. Mr. Capen said that he made his rows four and a half feet apart and let the plants run. They cover the ground so that alleys have to be cut between the rows. He thought that the plants needed stimulants before water.

N. B. White would add one other condition — thorough drainage. He wetted the roots of his plants as Mr. Capen did, and set them on the same plan as Mr. Earle. His land was underdrained to the depth of three feet, and currant bushes planted in it attained a diameter of an inch in three years. If he were selecting a new place he would look out for good drainage and plenty of water. Fall planting had so many disadvantages that he would not recommend it. The Monarch of the West did not favorably impress him the first year, but the plants were hardy, rooted deeply, and endured dry weather. Mr. White alluded also to his success in grafting grapes, first cutting the roots so as to prevent a redundancy of sap.

The Chairman agreed with Mr. White that the habit of growth of the Monarch of the West is exceptionally vigorous. The berries are fair and symmetrical, but not abundant or of first quality. The soil on which his plants grew is a deep alluvial—fine for the growth of plants.

Mr. Wilder thought the autumn a very improper time to plant strawberries. He had never had sufficient success at that season to pay for the labor of planting.

The Chairman thought it might be desirable under certain circumstances. He alluded to the method recommended by Peter

Henderson of preparing plants for forcing, by laying the runners in small pots. The speaker thought it better to pot young plants in spring, and shift into larger pots as the plants grew, by which large, fat crowns, full of fruit buds, would be ready when wanted for forcing. He thought that forcing strawberries might be made profitable. He believed also that they might be forwarded to advantage in cold graperies, and called on E. W. Wood for his opinion on this point.

Mr. Wood thought there would be but little time gained. He had commonly taken up his grape vines from the twelfth to the fifteenth of April, and it is not desirable to give extra heat before that time. In March he throws open the windows of his grapery at top and bottom; to keep them closed would injure the vines.

Mr. Wood spoke of the importance of these discussions as a means of diffusing information as to the best varieties of fruit, and especially as to the value of new fruits. The only opportunity to judge of new varieties is at the exhibitions, and it is impossible to tell from merely seeing a fruit whether or not it is desirable for general cultivation. He had been disappointed with the results of his own cultivation of Mr. Moore's new seedling strawberries, of which he had tested three varieties. From a row of the Belle, two hundred feet long, he did not pick a peck of berries, and the plants came out stinted in the spring, and the leaves curled. His experience was the same last year, but perhaps the plants need the "Concord sand," in which Mr. Moore says he grows his strawberries. Mr. Wood's soil is a strong loam with a clay subsoil.

Last year Mr. Wood tried the experiment of planting strawberries in August, though he had previously believed it useless to set them at that season. A crop of early potatoes had just been taken from the ground. He dibbled a hole and filled it with water, and did not lose a dozen out of seven or eight hundred plants. He learned the method from a vegetable grower.

Mr. Smith, being asked his experience with the varieties of strawberry mentioned by Mr. Wood, replied that it was the same as Mr. Wood's. The Grace produced a fair crop and the Caroline an abundant one, while the Belle proved a shy bearer.

Mr. Wood spoke of the Versaillaise currant as a good grower, and an abundant bearer, while a row of Dana's Transparent, alongside of the Versaillaise, had produced but a very small crop.

The Chairman remarked that many persons considered the Ver-

saillaise and Cherry currants identical, but in his view there was a difference in the foliage.

Mr. Smith said that some years ago he exhibited fruit of the Versaillaise currant, which grew on plants procured from William H. Barnes, who had the variety from Marshall P. Wilder, who originally introduced it into this country. The basket was decided by the Fruit Committee to contain a mixture of the Versaillaise and Cherry, and consequently Mr. Smith failed of the prize, which, he thought, would otherwise have been awarded to him. The next year a row which he had for the Cherry currant bore fruit, and he selected the long bunches from both rows, exhibited them as Versaillaise, and received the first prize. The London Horticultural Society had instituted a careful test of all the reputed varieties of the currant, and the conclusion, as respects the Cherry and Versaillaise, was that they are identical.

Mr. Wilder said that many years ago he imported from Europe a large number of varieties, including the Cherry, Versaillaise, and Fertile de Palluau, from M. Bertin, the originator of the Versaillaise. The Cherry and Versaillaise are very much alike except in quality, the former being decidedly more acid than the latter. Both have long and short bunches, but those of the Versaillaise will average longer than those of the Cherry. The American Pomological Society has decided that the Cherry is inferior in quality to the Versaillaise.

The Chairman said that the Cherry is more acid and watery than the Versaillaise. The growth of the Cherry as compared with the Versaillaise, is more stubbed and shorter jointed, the habit of growth resembling that of the Seckel pear as compared with the Bartlett. He had his plants from M. Transon, of Orleans.

Mr. Wilder said that the statement of the Chairman concerning the difference in growth of the two varieties was correct.

Mr. Hadwen had plants under both names from the late John Milton Earle, well known as a most accurate pomologist, and for many years thought them different, the long bunches being Versaillaise and the short, Cherry, but closer examination showed that there was not as much difference as he supposed. He found both kinds growing in the same row, and he thought that the more closely we observed the less difference we should find. If the difference is so slight as to puzzle the most careful horticulturists, it is of little consequence. To show how the same kind is liable to vary, Mr. Had-

wen said that a gentlemen in Worcester exhibited what appeared to be five different varieties of tomato, from one plant. The White Gondouin, Mr. Hadwen thought quite distinct from any other currant, in berry and bush, and with a decided difference in flavor. It is not as prolific as the White Grape, but it is the sweetest of all currants.

The Chairman announced that the subject would be continued on the next Saturday.

MEETING FOR DISCUSSION.

SATURDAY, March, 23, 1878.

A meeting for discussion was holden at 11 o'clock, W. C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The subject was the same as that of the last meeting, the Culture of Small Fruits.

The question of the identity of the Versaillaise and Cherry currants came up again, and was discussed at some length, the opinion that, while they strongly resemble each other, they are, nevertheless, distinct, decidedly preponderating. N. B. White thought that nurserymen had the two varieties mixed. The Chairman said that it was easy to perpetuate confusion when once introduced among varieties resembling each other. He had noticed a difference in the wood and habit of growth of the two varieties, yet it was easy for the best judges to mistake in fruit exhibited. He had a large plantation, partly Cherry and partly Versaillaise, which he should examine more closely than ever before, and he thought that after hearing what had been said in regard to these two currants we should all put on our glasses and watch them with more care.

The Chairman remarked that nothing was said of the raspberry in the discussion of the previous week. He thought it a fruit of more importance than the market would indicate. Many new and highly praised kinds were offered, some of which were sold as high as a dollar a plant. Among others little cultivated here, the Brandywine is receiving much attention. On inquiry it appeared that no one present had cultivated this variety.

E. P. Richardson had cultivated the Philadelphia for three or

four years. It is a great bearer, but only second rate in size and flavor, while it is a great deal of work to pick them. Mr. Richardson inquired why the highest prize for raspberries was awarded to the Saunders over the Herstine. He thought the appearance of the latter far superior to that of the former.

E. W. Wood, a member of the Fruit Committee, replied that the Committee were unanimous in the opinion that in quality the Saunders was superior to the Herstine. Mr. Wood referred to the Hornet Raspberry, exhibited for several years by William H. Barnes, which he thought promising. He also spoke of the Narragansett raspberry, a native of Providence, and exhibited here by the originator, from whom the speaker procured plants. These plants bore a second crop, which ripened in October, and he then picked a considerable quantity. The canes which bear this second crop die after it is ripe.

N. B. White and B. G. Smith said that the Hornet has the same characteristic.

Mr. Richardson had cultivated the Narragansett, and discarded it. He thought the Merveille de Quatre Saisons a magnificent raspberry for amateur cultivation.

The Chairman remarked that the Catawissa was the most productive of all the ever bearing varieties, but was valueless for the market.

Marshall P. Wilder said that he imported the Hornet and another variety raised by M. Souchet, more than twenty years ago. The Hornet is the largest of all raspberries; it is not of first quality, but is a strong grower and bears fairly. The other variety raised by M. Souchet was a white one, and bears the name of the originator. It is a most abundant bearer, and, parting freely from the core, is very easily gathered. Mr. Wilder thought he had picked more from it than from any other kind, and regarded it as one of his standard varieties. He did not think the Philadelphia worth growing. Knevett's Giant is a splendid variety. The histories of this and of the Franconia resemble each other, and are quite curious. The Knevett's Giant was sent from England to Mr. Wilder, by Messrs. Chandler & Co., with a lot of camellias. Mr. Wilder afterwards wrote to Messrs. Chandler for more, and was informed that the little bundle sent him was brought in by an unknown person, and was all they had ever had of the variety. The first introduction of the Franconia was by two plants sent by Vilmorin, of Paris, to Samuel G. Perkins, from which all those in the country

have originated. Neither the Knevett's Giant nor Franconia are found in any European Catalogue.

B. G. Smith had grown the Franconia for fifteen years from the same stock, and year before last took the first prize with it.

J. W. Manning questioned whether there had been any improvement in raspberries for the last forty years. He had grown the Franconia an inch in diameter. Knevett's Giant is not as hardy as the Franconia. The Belle de Fontenay and Merveille de Quatre Saisons are very much the same as the Knevett's, in habit of growth, appearance of the fruit, and in bearing a crop in autumn on the new wood.

Mr. Richardson thought the Brincklé's Orange the finest raspberry for family use. He inquired why raspberries sometimes produced fruits with only a few of the grains developed. He thought it probably owing to a defect in the fertilization of the flowers. The Narragansett is particularly objectionable on this account.

Robert Manning said that in raising raspberries from seed, as in raising native grapes from seed, a large proportion of the plants will be entirely barren. Many others will bear only imperfect berries, and there seems to be a tendency in some of the standard varieties towards this condition. The only practical suggestion which the speaker had to make, was that in propagating, suckers should be selected from those plants and stools only which bore perfect fruit. The Franconia, he thought, from its firmness, most valuable for market. Its spirited acid makes it desirable for preserving. After it is gathered its texture and flavor both become mellowed, and twenty-four hours after picking it is better for the table than when just picked. Knevett's Giant is earlier than the Franconia, and fine for family use. It sometimes adheres slightly to the core in picking. The old White Antwerp and Brincklé's Orange are the finest for eating as "hand fruits."

Mr. Wilder said, in answer to an inquiry as to the value of the Black Cap raspberries, that they are earlier than the others (as the children soon find out), and valuable on that account. Davison's Thornless is one of the best.

The Chairman said that the McCormick or Mammoth Cluster is the largest and best of the Black Cap class, and also very prolific.

J. W. Manning agreed with the Chairman, and added that the Souhegan is a new variety and highly recommended.

Mr. Richardson had tested the Golden Thornless and found it worthless. This was confirmed by several gentlemen.

Mr. Wilder said that no "White Black Cap" is worth growing. They are all of a disagreeable "mulatto" color.

Robert Manning alluded to the statement made by Mr. Wood, as to the unproductiveness of the Dana's Transparent currant, which he thought liable to produce a wrong impression. He had two short rows of Versaillaise and Dana's Transparent, side by side, and the latter, though not so vigorous as the former, was quite satisfactory both as to growth and productiveness.

Mr. Wood said that his plants of Dana's Transparent growing among his pear trees, drop their foliage when the fruit is about two-thirds grown, while the Versaillaise retains its foliage.

Mrs. E. M. Gill had had the same experience as Mr. Wood with the Dana's Transparent, though well watered. Red currants, under the same treatment, did not lose their foliage.

Mr. Smith had been very successful with Dana's Transparent; the foliage did not drop. He watered and mulched the plants.

Henry Ross said that Mr. Wood's Versaillaise currants were superior to those which he raised himself. He had grown seven or eight varieties, and thought the Red Dutch the sweetest of all the red currants.

J. W. Manning thought the Lovett's Red or Improved Red, originated many years ago by Capt. Josiah Lovett, a most skilful cultivator, the sweetest red currant. It is a great bearer.

Robert Manning thought the Red Dutch superior in quality to the Versaillaise, and the White Dutch superior to either the Dana's Transparent or the White Grape.

Mr. Wood spoke of seeing fruit of the Versaillaise at Mr. Wilder's grounds when first introduced, and of the skepticism of a friend to whom he spoke of it, as to its being so much larger than the Red Dutch, but who gave up and owned himself beaten when a basket of the fruit was shown him. Mr. Wood thought the Dutch no better in quality than the Versaillaise.

Daniel T. Curtis had seen a berry of the Versaillaise measuring two and one-eighth inches in circumference. He spoke of the skilful culture of the currant and gooseberry by the late Thomas Dowse, of Cambridgeport, who preserved the fruit on the bushes until October.

The Chairman announced that an Essay on "Peat as a Fertilizer and an Absorbent," would be read by H. Weld Fuller, on the next Saturday.

MEETING FOR DISCUSSION.

SATURDAY, March 30, 1878.

A meeting for Discussion was holden at 11 o'clock, W. C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The following essay was read by the author, H. Weld Fuller, of Boston: —

PEAT AS AN ABSORBENT AND AS A FERTILIZER.

Agriculture is admitted to be one of the great pillars of the state. The health, the wealth, the contentment, growth and happiness of a people depend upon it for support. Without the ploughshare and pruning-hook, the sword and lance would become useless in war; and in peace there would be no fixed habitations and little increase in population. But, to lift us above the savage life, agriculture must have brains and manures. The farm requires a good supply of both. He is the best farmer who uses both to the best advantage. Soils are as various as the persons who till them; and the true farmer will study their temper and make the most of them. Science is the economy of force — lessening work and increasing the results. If the husbandman would better his own condition, or the condition of his poor lands; if he would keep his good lands, or himself, in good heart, or honestly get much out of little, or more out of much; if, in a word, he would live and thrive by his products and not impoverish his place, he must farm with brains and manures.

Good husbandry is based on manures, rightly prepared and rightly applied. When nature stores away the phosphates in the hill-side, or fills our swamps or lowlands with nitrogenous matter, she leaves it for us to find out their value and profit by them. She is often lavish of materials; but her beneficiaries may use or abuse them as they please. Some soils consist almost wholly of vegetable remains, so apparent to the eye that we might naturally regard them as just fitted for immediate use; whereas, their worth depends upon their preparation and skilful application. Such are the different varieties of PEAT, of which I would now speak.

These are, as we all know, of several kinds; the mild, the sour, the coaly, etc. In other words, the fuel peat, the black muck, etc.,

each kind having some qualities peculiar to itself, but all containing the most essential requisites for a good manure. The peat which has long been used for fuel, is that tough, spongy and fibrous compound in low lands or bogs, which bends under the feet and retains its shape when dug or cut. It abounds in the country, and here in Massachusetts, of late, machinery has been introduced and is now operating to remove, grind and manufacture it into fuel, entirely regardless of other uses. The ashes of this kind of peat, as well as that from marshes near the sea, have for more than a century been sought as fertilizers. In Holland and elsewhere, peat has often been burnt merely for its ashes, which were sold by the bushel for manure; the farmer losing thereby all the volatile portions best adapted to his plants. Nevertheless, as more or less of calcareous matter was contained in the ashes, they were good for sandy soils, and the waste was not total. If skilfully mixed with animal manure and properly decomposed, this variety is deemed the most valuable.

The brown or black muck, which is more common with us, differs from the fuel peat, in being softer and more decomposed. It consists mostly of decayed and decaying vegetable matter, with some earthy and mineral admixture, and is nearly in the state of vegetable mould, or "*humus*," sometimes called "*geine*." The value of this muck depends very much on its position. If it has been continually subject to drainage and leaching, much of its virtue may have run off and little remain. But if it has been confined within a flat basin, without any outlet or overflow, and not too much flooded, it will retain its tannin, nitrogen, and fertilizing salts, which may be converted into the best of plant food.

All peat is a concentrated vegetable carbonaceous compound. The average muck of Massachusetts contains, as found by analysis, twenty-nine parts of soluble matter and about fifty-five parts of insoluble; about one-third its substance being soluble. It is capable of holding much moisture, and, when dried in the sun, still contains about two-thirds of its weight of water. It has organic matter, and often acids, in excess; although its principal ingredient is carbon. Oxygen and highly nitrogenized crenic and apocrenic acid, are always present, with traces of ammonia. But in its fresh state, it is almost inert. To utilize it, therefore, animal manures or salts should be employed to quicken its action. *Air* and *water* are to do the most of the productive work; and they are so essential in

vegetation that whatever manure appropriates these elements to the greatest extent may be regarded as the most beneficial. Four-fifths of all growth comes from them. Some chemists have contended that water is the only dressing needed; that the overflows of the Nile and of our meadow streams, which annually enrich the lands, bring to them nothing very fertilizing except the water; and that the amount of water retained by a manure is a good test of its quality, as the air is constantly co-operating with it to prepare the needed food. We cannot well over-estimate the importance of either of these elements. Although only one-fifth part of our common air consists of oxygen, yet so essential is the supply of oxygen in nature, that more than one-half of the weight of all the solid rocks of the globe is composed of it; without it, there could be neither life nor decay. Oxidation and decay cannot proceed without it, and they are the only sources from which come the renewal and supply of all vegetable matter. Decay is a species of oxidation or slow combustion—a consuming or burning process, whereby a change is effected as by heat; the color of a substance is changed and darkened by it, as if slightly charred, and finally it falls to powder. Too much water will check this decomposition, but a good quantity is needful.

Peat is fertilizing matter undecomposed, or matters in which decomposition may have commenced. Indeed, fermentation is necessary to bring out its virtue. Generally, the blacker the peat, the better it is; and that kept longest is best, provided it has been kept out of the bog and has not been fire-fanged or flooded. But it must be decomposed before it is available for plants; fresh peat is not to be ploughed under and immediately mixed with the earth. A peat-bog may be thoroughly drained and ploughed, yet, rich as it is in material, the first year's product will be disappointment and failure, for the soil will be sour and undecomposed, and in no condition for plant growth. The application of plaster of Paris, or lime, in moderate quantity, would be beneficial in such ground by decomposing the soil and bringing into activity its humus and insoluble matter. But if the soil is too rich in humus, there is danger of forming thereby an injurious humate of lime, and also of setting free too much corrosive sulphuric acid. On clayey grounds, excepting in warm and wet seasons, gypsum is of little account. On sandy or gravelly lands, applied just before or after a rain, it succeeds well. It must not, however, be often repeated or long

applied to the same land without the use of animal manures. And the same may be said of the use of fertilizing salts.

They are good in their season; but animal manures are indispensable. All plants, except fungi, require alkalies and alkaline earths. They must be supplied with both organic and inorganic matter, and that, too, in a condition for use. They feed in a mysterious way, on infinitely small particles, and have a choice of these. They select from among the particles of inanimate matter the parts they need, and which will combine and assimilate only under fixed conditions and limitations. They refuse, during life, to obey the chemical laws which govern organic matter, but after death they become subject to them, and dissolve accordingly. While they live and grow, they appropriate and organize inorganic matter. They never directly absorb organic matter, and yet they cannot grow in a soil without it. A good soil will contain about one-fifth part in weight of such matter; but the plants will drink only the gases, and wait for the dissolution of the compounds. The volatile portions of all their reserves are the most valuable, and water helps to generate them and retain them for use. It brings to them carbon and ammonia in right proportions. Rain mechanically opens the earth anew, and sweeps away the useless and inert air and other matter, with some noxious compounds, making room for, and introducing new and fresh reinforcements. Electricity, light, heat, air, and water are continually working for us in a way incomprehensible, but always by fixed laws, the observance of which laws when known tends vastly to our advantage. As I have said, organic matter must be always at command in the soil, and there is no better way of supplying this organic matter than by mixing peat with *animal manures*. These manures not only tend to modify the mechanical texture of the soil, but they furnish carbonic acid and ammonia, or nitric acid, and the earthy and saline compounds required by plants. They assist in the decomposition of the vegetable matter, while the absorbing peat seizes and retains all their most volatile parts, one-half or two-thirds of which might otherwise escape. It has been estimated that one cord of animal manure, properly composted with peat, will make four times its original value in good manure.

As ammonia is the natural food of plants, the best manure is that which will produce and retain the greatest amount of nitrogen, which is the base and principal ingredient of ammonia. If nitrogen

is furnished in the solids, the atmosphere will supply the hydrogen needed to form the ammonia. Hence, the amount of nitrogen it can furnish, mostly determines the value of a manure. Prof. Johnston is of the opinion that ammonia is supplied to plants by the natural decay of animal and vegetable substances; and that nitric acid is formed partly by the oxidation of *dead* organic matter, and partly by the union of oxygen and nitrogen through the electricity in the air.

Nitrogen, however, is the great operator and food provider of plants. The ammonia produced by it and its power to form nitrates are invaluable. Nitrates in which the nitrogen exists as an acid are great workers in the decomposition and decay of organic matter, either in the compost heap or in the soil. But salts alone, without the addition of nitrogenous matter, will not long avail. Neither will carbonic acid or ammonia alone be sufficient. Organic matter is essential to success. Extremes of all kinds are to be avoided, and every factor must work without violence, *in due time*, within proper limits, and with plenty of liquid. A good manure is that which will furnish the necessary ammonia when wanted, or which, by its combinations, can be easily converted into ammonia. The humus of peat is continually decaying, and is thus continually forming carbonic acid; it is also taking up nitrogen from the air and converting it into nitric acid and ammonia. It gives warmth and porosity to the soil, and supplies it with soluble materials; while the insoluble earths are consumed by the acids, and thereby adapted to vegetation. Nitrates, and other salts (without animal manures), must not be applied repeatedly to the same land. In the absence of alkalies, no vegetable fibrine or vegetable caseine can be formed. Alkalies, with animal manures, have the power to form nitrates and become very effective. Peat has the power to form alkalies, and this power is of great service.

Dr. Dana says, that one cord of fresh peat will neutralize one hundred pounds of soda-ash; and that one cord of barnyard manure will decompose from three to six cords of peat. One dead horse, well covered with peat, will convert fifteen or twenty tons of peat into a manure equal to the average from the stable; for it will separate nearly all its nitrogen from the other constituents, and hold it in the heap. He thinks, also, that the salts contained in one cord of peat are equal to the droppings of a cow for three months, and, by analysis, they are found to have the same chemi-

cal qualities, excepting that there is less activity and odor in the peat. The late Mr. Phinney, of Lexington, declared that if two cords of peat were mixed with one cord of cow manure, the mixture was fully equal to three cords of fresh cow manure.

The weight of authority seems to indicate that one ton of manure from the barn, will decompose from three to six tons of muck, but it is better to use a larger proportion of animal manure. Complaints have sometimes been made that the use of peat and muck produced sour and meadow grasses. But if so, they must have come from applying the peat before it was properly ripened and sweetened by age and decomposition, without which little effect is seen.

Peat must be used discreetly, and the following hints may not be inappropriate:

1st. As a rule, peat should be dug several months before it is taken to the barn or compost heap. The weight to be carried will then be lighter and its absorbent qualities greater.

2d. The old rule, of keeping the compost through two summers and one winter (or for two years) before use, stands good today, where the best economy is exhibited. Time — a long time — is essential to its decomposition and it should not be used until decomposed.

3d. If possible, protect occasionally the compost by rough boards, from excessive flooding by rains. And if peat is placed under the barn, let it be two feet thick and so placed as to catch all the liquids from the stalls, such liquids being one-sixth part more valuable than the solids. Add any waste vegetable matter, as often as may be, and see that the drainage from the stable does not rob the compost.

4th. Fermentation must be encouraged, but the pile must not become fire-fanged or overheated. When found to be at blood heat, turn it over or water it.

Few persons realize that in the decay of animal or vegetable matter the same amount of heat is thrown out as there would be if the same matter was consumed by fire; and the heat is just in proportion to the rapidity of the decay. In warm weather, a compost heap may become heated in ten or fifteen days. It is well, therefore, to lay a few sticks into the heart of it, which can be withdrawn and the heat tested, as occasion may require.

More than a century ago, Lord Meadowbank gave directions as

to the best mode of making a compost bed of peat, some of which are not now inapplicable. Availing myself of some of his suggestions, I will take the responsibility of here giving my own.

If a large bed is to be formed, select a convenient spot, nearly level, and mark out a parallelogram, about twelve feet wide, and of any desirable length, for the ground to be occupied. Cover this bed over with peat, which has been dug several months, to the depth of ten inches; then dump successive piles of barn manure in a line close up to the sides of the peat, sufficient to cover it to the depth of six inches, to be shovelled in. Protect the exposed sides, as filled up, and dump along them enough more peat to raise the bed about eight inches more, and shovel it evenly over the manure; then, in like manner, add about four or five inches of manure, and so on, adding peat and manure in alternate layers until the pile is about four feet high; the last or top layer always to be peat and the sides protected by it, and the upper layers being thinner than the lower.

After fermentation has commenced, see that the heat is not too great; and when necessary, begin at one end, and facing that way, throw the material, well mixed, toward that end, operating straight across the heap and to the very bottom, smoothing and securing the sides as the work goes on. Do this as often as any vapor with the odor of ammonia or manure is perceived. Sticks may be placed in the pile to test the heat, as already suggested. Rain storms are sometimes long-continued and severe, and it would be well to have a partial covering of rough boards in readiness for occasional protection from a flood.

If only a small quantity of manure is used, the heap may be one or two years in the process of decomposition; but if a large amount of manure or salts is employed, the process may be hastened. Any waste vegetable or animal matter, kelp, bone-dust, or a small sprinkling of slaked lime may be intermixed with profit. If animal manure is wanting, fifteen or sixteen bushels of leached wood ashes to a cord of peat will excite fermentation. Sixty pounds of soda-ash or ninety pounds of potash, dissolved and evenly distributed in a liquid state, will decompose a cord, but earth or peat should always be at the top of the compost, to arrest any liberated gases.

Dr. Jackson, after recommending the mixing with lime or ashes, as tending to disengage the ammonia, saturate the noxious acids, and convert them, by combination, into fertilizing salts—adds this cau-

tion—"but *too much* lime applied to a heap may cause a burning of the material and make it but little better than charcoal."

If lime is used at all, it should be applied in such moderate quantities that its mixture with fresh peat will generate a degree of heat so slight as not to prevent the absorption of the fertilizing acids and gases generated in the pile. But it is safer and better in all cases to employ the alkaline salts instead of lime.

To conclude: Peat, decomposed with animal manures, is undoubtedly an admirable manure; especially for high lands, or sandy, gravelly, or loamy soils. In fact, it is good on any soil.

It is valuable, as a *great absorber* of water and gases:

It is valuable, as a *great retainer and feeder* of these:

It is valuable, as a *constant collector and renewer* of supplies, and as a *great assimilator* of plant food.

For fruit trees and grass, it is exceedingly efficacious.

If it is objected that its black color attracts heat to such an extent as to burn the grass over which it is spread, we may reply, "if it heats more quickly, so it cools more quickly;" and if in hot weather it becomes quickly heated at mid-day, so it cools quickly towards evening and will for an hour or two longer than otherwise, bring down and hold the refreshing dews of the season. Its humus, by constant decay, keeps up a needful aid, and the naturally inert material, by proper admixture, becomes an efficient power. The old saying may still be true, "Muck makes the meal-chest."

Discussion.

The Chairman said that this most suggestive essay opened up another phase of the fertilizer question, which had been discussed here this winter, and called on members present to give their views on the subject.

Benjamin P. Ware said that he had had a good deal of experience with meadow muck, and the opinions which he had formed varied much from those of some others of equal experience. This appeared very strange, and he could account for this difference only on the supposition of a difference in the quality of the muck. He thought the subject had been fairly presented, and the views of the essayist were very much in accordance with his own. He lives on the sea-shore and obtains much manure from the sea—mainly kelp.

This heats and decomposes very rapidly, and is excellent for composting with muck. Success depends very much on the amount of fermentation which can be produced in the heap. He preferred to dig the muck two or three years before using, as the winter frosts decompose it faster than any other agency, and the rains assist. He digs out a large quantity in August, and removes it to the site of the compost heap in winter when the meadow is frozen so that it will bear teams. He thought that a mixture of two-thirds muck and one-third kelp, was as good as entire sea manure. Horse ma nure, or anything that will produce fermentation, is good for mixing with the muck. Fish pomace is admirable. He did not think it needful to cover the compost heap from the rain. His brother hired the Pickman farm in Salem (a milk farm with a large stock of cattle), when it yielded seventy-five tons of hay. By the use of muck, composted as described, in addition to the dung of the cattle, in three years he brought the produce of the farm up to two hundred and twenty-five tons.

The speaker had used muck all his life, and felt much interest in the subject of the essay. He formed his compost heaps very much as described by the essayist. The heap should be forked over frequently, as every stirring produces a new fermentation. A mixture of lime and salt may be used in the compost heap and add to its fertilizing qualities. While some muck has very little value, that which is valuable is inert until decomposed. Green hide is not leather, but becomes leather when tannin is chemically united with it. So meadow muck in a cold, inert condition is not manure—not a fertilizer—but let it be fermented and it becomes one of the most valuable fertilizers.

The Chairman regretted that some of the vegetable growers, who were present at the opening of the meeting had left, as he would have liked to hear their views. He believed that generally they prefer unadulterated fertilizers, like the strongest stable manure, to muck compost. He agreed with Mr. Ware that there is very little value in meadow mud just taken out. This was shown in an old orchard which the speaker had lately removed, where a quantity of meadow mud was placed under each tree. It had remained unchanged for forty years, and the roots avoided it as if it were poison. It should lie two or three years after being dug and be subjected to fermentation. The general experience of cultivators

does not corroborate Dr. Dana's theory as to the use of salts in curing mud.

Mr. Fuller thought that it would not do to use the salts exclusively or without barnyard manure. He agreed with Mr. Ware that time is the great curer of muck.

B. G. Smith had derived great advantage from the use of muck in his garden. Some years ago he had one hundred and fifty cartloads brought in, which laid exposed to the atmosphere. Before composting he mixed it with lime to sweeten it, using on three or four cords a barrel of lime, slaked with water in which half a bushel of salt had been dissolved. He then composted one-third of barnyard manure with two-thirds of muck, letting it lay two or three years, and turning it over two or three times.

Henry Ross had used several hundred cords of muck and had not been so successful as the previous speakers, but perhaps he had not used brains enough. Any one who crosses a swamp, and notices the luxuriant growth of trees and herbage, among which pine stumps four feet in diameter may sometimes be seen, must be convinced that it contains vast quantities of plant food. As superintendent of the Newton Cemetery, he had had occasion to grade two or three acres of lawn at a time, in a sandy soil. He had dug out large quantities of muck, and, after grading, spread it on three or four inches in thickness, digging it into the subsoil and replacing the loam over it. He then manured highly and sodded or sowed his grass seed, and found that, applied in this way, the muck was of great benefit in retaining moisture. It is also useful as an absorbent of fertilizing gases. It holds frost so late as to be objectionable as a top-dressing. He intended to use a compost of bone-dust and muck side by side with the Stockbridge fertilizer the coming season. He did not like to use barnyard manure as a top-dressing, on account of its disfiguring the lawn.

Mr. Ware advised Mr. Ross to mix fish pomace with his meadow mud and bone, but Mr. Ross replied that the odor from fish would be objectionable in the cemetery.

Mr. Fuller said that he was acquainted with the location of Mr. Ross' land and peat deposits, and that there was a stream running through, which might drain the virtue out of the muck. If the muck was taken from such a deposit, he should not expect any advantage from it. Muck is of little or no benefit, when ploughed in before it is decomposed. He agreed with Mr. Ware that ordinary

rains would not injure a compost heap, but it should be guarded from excess of rain. The roof over it should not be tight, but may be of loose boards, as the compost will not ferment without some moisture.

Mr. Ross said that the muck which he used was not taken from the place referred to by Mr. Fuller as having a stream running through it, but from another deposit not liable to that objection. The quality of the latter was such that manufacturers of poudrette chose it in preference to any other. While his compost heap is decomposing he throws brush over it to keep off the sun. He was still of the opinion that the best use of muck is as a retainer of moisture, and as an absorbent of ammonia and other fertilizing gases, but he had learned a good deal from what had been said today. In answer to an inquiry Mr. Ross said that the grass roots extend down to the layer of muck which he places under the top soil, but do not enter it.

Mr. Smith thought that if muck is of little or no use, as is the opinion of some, many people in Cambridge are much benighted.

Mrs. C. N. S. Horner said that while the value of peat as a fuel and as a fertilizer had been mentioned, one important use had been omitted, viz.: as a deodorizer. As an absorbent around sink drains, etc., it produced a wonderful effect in deodorizing them.

M. H. Merriam said that his first experiment in the use of peat was by digging it and exposing it to the frosts of a single winter, which rendered it light and friable. Once a week he carted into the barnyard three times the amount of the droppings. Early in spring it was carted out and applied to fodder corn and potatoes. The growth of both, early in the season, was remarkable, and the corn being cut early needed nothing more, but the potatoes suffered more from drought than those where other manure was used. Perhaps the muck was not sufficiently decomposed. In another experiment sods and similar materials were laid on brush, so as to form a free drainage, and muck placed on top. Liquid manure was then poured over the whole, and produced a very rapid fermentation, decomposing even potato stalks. His most successful experiment with muck was in composting it with the refuse of animal skins boiled down to a glue. When this was incorporated with the muck, fermentation soon commenced and produced a fertilizer which he had never seen equalled in its effect on grass fields. The place where it was applied could be distinguished all through the season,

and though this was five or six years ago, the effect is still perceptible. The glue was thoroughly incorporated with the muck while in a liquid state, and applied at the rate of twelve hundred pounds of dry refuse to the acre.

James Cruickshanks remarked that the muck generally used here is very different from that which he knew in Scotland. Most of it there can be cut out in bricks. At Woodlawn Cemetery, in making an avenue through a swamp, he dug out a large quantity of peat, which he began to use after it had lain two years, and continued to use for eight or ten years. Having occasion to plant a hedge of arbor vitæ, which is a swamp plant, he dug a trench eighteen inches wide and the same in depth, and filled in six inches of muck in the bottom, and on this placed six inches of soil. He then set the plants and gave them a thorough watering, and in forty rods of hedge he did not lose more than five plants. He thought the muck useful in retaining moisture.

Mr. Fuller said that lime must be used only in moderate quantities in connection with peat. If used too largely the peat will be charred. He thought that a sprinkling of lime on the successive layers — just enough to cover each layer of the compost heap — would be sufficient. In answer to an inquiry, Mr. Fuller stated that quick lime may, by its action, discharge valuable gases. He used last spring 2,200 bushels of ashes, which was procured from lime-kilns in Maine, and, though largely mixed with lumps of lime and other rough material, it produced a good effect as a top-dressing on a sandy soil.

Marshall P. Wilder said that the remarks which had been made had established several principles in regard to the use of peat. It should be taken out in a dry time, and allowed to drain, saving expense in carting; it should lie a year or two before composting, and it should be thoroughly decomposed. He was very glad to hear from Mrs. Horner in regard to its deodorizing properties, which he attributed to its carbonaceous composition. When properly matured by age it is one of the purest of soils. By a pure soil he meant one entirely free from manure. Certain plants are cultivated in a mixture of peat and sand alone, and in such cases the growth is largely due to proper watering. He had two farms, and bought a meadow for the peat which it contained, and which he found most useful as a fertilizer, but only when old. Many years ago he recommended a cord of peat, mixed with six bushels

of unleached wood ashes and a bushel of bone-dust, as an excellent fertilizer for fruit trees.

Now that the meetings for discussion were about to close for the season, Mr. Wilder wished to say that he had been much interested in them, and believed that they had been very advantageous to all who had attended. He referred to the Chairman of the Committee on Publication and Discussion, who presided on this occasion, as the projector of these meetings, and as having done more than any one else to sustain them, and expressed the conviction that he had never done the Society a more beneficial service. No lady or gentleman could come in to one of these meetings without gaining some information, even on the most common subjects.

N. B. White said that peat was always found in low places, and that it is very expensive to get it up on high land. If the meadow is so situated that it can be drained and cultivated, he believed that that course would be found more profitable than digging and composting the peat. He thought, also, that poor or exhausted soils could be brought to a state of fertility at much less expense by ploughing in green crops, than by fertilizing with peat compost, which requires so great an amount of labor.

The Chairman said that, though many of the best cultivators do not use a great amount of peat, he thought all would agree as to its value as an absorbent and in handling manure.

Rev. A. B. Muzzey, of the Committee on Publication and Discussion, remarked that we have in the Society abundance of material for very interesting essays, and suggested that during the interim the members should be maturing papers to be read when the meetings are resumed another season, which would be a great assistance to the Committee.

The Chairman then announced that the meetings for discussion were closed for the season.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1878.

PART II.

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TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, April 6, 1878.

A duly notified stated meeting was holden at 11 o'clock, President GRAY in the chair.

The President announced that the Flower Committee had organized by the choice of William H. Spooner as Chairman.

On recommendation of the Executive Committee, WILLIAM BULL, of Chelsea, England, and ISIDOR BUSH, of Bushberg, Missouri, were chosen Corresponding Members of the Society.

The President, as Chairman of the Executive Committee, reported a recommendation that the Society appropriate three hundred dollars to meet the expenses of the Committee of Arrangements for the current year, and one thousand dollars to the Committee on Publication, for the publication of the History of the Society. These appropriations were voted on separately, and were unanimously passed.

On motion of Marshall P. Wilder, the subject of the celebration of the Fiftieth Anniversary of the Society was referred to the Executive Committee, with full powers.

Marshall P. Wilder, in some appropriate remarks, announced the death of Hon. Willard C. Flagg, of Moro, Illinois, a Corresponding Member of the Society, and moved the appointment of a committee to prepare memorial resolutions. The Chair appointed Marshall P. Wilder, Charles M. Hovey, and Robert Manning, as that Committee.

Adjourned to Saturday, May 4.

BUSINESS MEETING.

SATURDAY, May 4, 1878.

An adjourned meeting of the Society was holden at 11 o'clock. The President and Vice Presidents being absent, Marshall P. Wilder was chosen President *pro tem.*

The following named persons having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

J. ARTHUR BEEBE, of Boston,
WILLIAM H. BOWKER, of Boston.

The President *pro tem.*, as Chairman of the Committee to prepare resolutions in memory of Hon. Willard C. Flagg, reported the following:

Resolved, That in the decease of Hon. Willard Cutting Flagg, a Corresponding Member of this Society, we recognize and mourn the loss which we, in common with the public, and especially the agricultural and horticultural community, have sustained, of one of its ablest and most eminent workers and writers. Mr. Flagg held at various times the positions of Secretary and President of the Illinois Horticultural Society; was Corresponding Secretary of the Illinois Industrial University from its foundation to his decease, and, at the time of his decease, was Secretary of the American Pomological Society, President of the National Agricultural Congress, President of the Illinois Farmers' Association, and one of the chief editors of the American Encyclopædia of Agriculture. He was also a trustee at various times of several State institutions, including the Illinois Industrial University, and was, for several years, a Senator in the Legislature of Illinois. But, while recognizing his eminence, as shown by the many offices which he has been called to hold, and in which it will be difficult to fill his vacant place, we would especially remember his enterprise, his thoroughness in all that he undertook, his spotless character, in public as well as in private, and the universal esteem in which he was held for his probity, social qualities, and high culture. We would remember him as a man of strict honor and integrity, who loved justice for the sake of justice, and whom none could swerve from the path of duty.

Resolved, That these resolutions be entered on our records, and

that a copy be transmitted to the widow of Mr. Flagg, with the assurance of our warmest sympathy with her in her sad bereavement.

Robert Manning said that he became acquainted with Mr. Flagg at the meeting of the American Pomological Society, at St. Louis, Missouri, in 1867, and recognized him as a man of natural intelligence, trained by education, and especially desirous to do fully and thoroughly whatever he did; and that further acquaintance with him, personally and by correspondence, had continually deepened this first impression, and he regarded his loss as a national calamity.

Benjamin G. Smith said that he was greatly impressed by Mr. Flagg's energy and force of character, and his strong personal magnetism. He regarded him as one of the most valuable men in the horticultural world, and the longer his acquaintance, the more his esteem for Mr. Flagg increased.

The Chairman of the meeting said that while the death of Mr. Flagg was a severe loss to the horticultural world, it came nearer home to him as President of the American Pomological Society, for, as Secretary, Mr. Flagg was his right hand man. To energy and despatch in business, he united thoroughness, in rare combination. Though naturally strong and healthy, he was carried down to the grave by the weight of his labors as agriculturist, horticulturist, and statesman.

The resolutions were unanimously passed.

The President *pro tem.* announced the decease, since the last meeting of the Society, of one of its founders and original corporators and its first Treasurer, Cheever Newhall. On motion of A. D. Capen, the Chairman of the meeting, C. O. Whitmore, and P. B. Hovey, were appointed a committee to present resolutions in memory of Mr. Newhall.

The Chairman, as President of the American Pomological Society, presented copies of the Proceedings of that Society.

Adjourned to Saturday, June 1.

BUSINESS MEETING.

SATURDAY, June 1, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, Vice President C. H. B. BRECK in the chair.

CHARLES E. RIDLER, of Kingston, and
Miss KATIE A. HILL, of Lowell,

having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society.

Marshall P. Wilder, Chairman of the Committee to prepare resolutions in memory of Cheever Newhall, presented the subjoined, remarking that, probably from his great age, it had been his lot oftener than he could wish to offer such resolutions, and that he did it in conformity to his views of duty to those who had gone before us. He eulogized Mr. Newhall as a man, a horticulturist, and a farmer, and added that, since his decease, the only survivor of the eight gentlemen named in the charter of the Society is John B. Russell, now of Newmarket, N. J.

Resolved, That in the death of Cheever Newhall this Society has lost one of its oldest and most valued members, — one whose name appears in its act of incorporation, passed almost fifty years ago, — and a true and constant friend of our association.

Resolved, That in the valuable services rendered by him we recognize the faithful discharge of official duty as the first Treasurer of the Society; as Vice President for seventeen years, and as a liberal patron of agriculture, horticulture, and rural improvement.

Resolved, That while we sympathize with his bereaved widow and relatives in this affliction, we desire to recognize the Divine Goodness which gave to Mr. Newhall and to the Society such a long and useful life, which will ever be commemorated by the excellent portrait that now adorns our walls.

Resolved, That these proceedings be entered on our records, and that a copy be transmitted to Mrs. Newhall.

Gen. Josiah Newhall seconded the resolutions, and said that Cheever Newhall had for fifty years been one of his dearest friends. He was a descendant of Thomas Newhall, who settled in Lynn in 1630. He was one of the best informed and most successful prac-

tical farmers in Norfolk County; and one of the founders, and, for a long course of years, a Vice President, of the Norfolk Agricultural Society. He was President of the Massachusetts Agricultural Club from its formation to his decease, and was a member of the United States Agricultural Society. As a merchant, he was distinguished for uprightness and integrity, and was always faithful in every sphere of duty.

Vice President Breck said that in 1839, when a boy, he became acquainted with Mr. Newhall. They met in the office of the "New England Farmer," to which paper Mr. Newhall was a frequent contributor. He thought that Mr. Newhall had done as much as any one in New England for the promotion of agriculture. He was highly esteemed as a man, and as a merchant was upright in all his acts.

Aaron Davis Capen said that Mr. Newhall had resided in Dorchester for at least fifty years, and that he had known him all that time. He knew him well, and knew well of him. Those employed by him bore testimony to his worth. Mr. Capen had rarely heard a man so highly spoken of by those who worked for him. They never received a harsh word or unkind treatment from him.

The resolutions were unanimously passed, and the meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, July 6, 1878.

A duly notified stated meeting of the Society was holden at 11 o'clock, Vice President C. H. B. BRECK in the chair.

The only business was the announcement of the reception by the Secretary, of letters from Mrs. Willard C. Flagg, and Mrs. Cheever Newhall, acknowledging the receipt of the resolutions passed by the Society in memory of Mr. Flagg and Mr. Newhall.

Adjourned to Saturday, August 3.

BUSINESS MEETING.

SATURDAY, August 3, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, President GRAY in the chair.

The Secretary presented a communication from the United States Commissioner of Agriculture, inquiring as to the cause of the grape rot. On motion it was voted that the communication be referred to the Fruit Committee.

Agreeably to the Constitution and By-Laws, the President appointed the following named members a Committee to nominate suitable candidates for the various offices of the Society for the ensuing year: C. O. Whitmore, W. C. Strong, C. H. B. Breck, C. N. Brackett, J. D. W. French, A. B. Muzzey, and E. W. Wood.

ALEXANDER ANDERSON, of Hingham,

having been recommended by the Executive Committee, was, on ballot, duly elected a Life Member of the Society.

Adjourned to Saturday, September 7.

BUSINESS MEETING.

SATURDAY, September 7, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, Vice President C. O. WHITMORE in the chair.

The Chairman presented the report of the Nominating Committee, which was read by the Secretary.

Marshall P. Wilder announced the decease, since the last meeting, of William R. Austin, long an officer of the Society, and an experienced cultivator, and moved that a committee of three be appointed to prepare memorial resolutions. The Chair appointed as that Committee, Charles M. Hovey, Marshall P. Wilder, and William C. Strong.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, October 5, 1878.

A stated meeting of the Society, being the annual meeting for the choice of officers, was holden at 11 o'clock, President GRAY in the chair.

Notice of the meeting having been given in accordance with the Constitution and By-Laws, the polls for the election of officers and committees were opened at five minutes past eleven. The President appointed E. W. Buswell, John G. Barker, and John C. Hovey, a Committee to receive, assort, and count the votes given, and report the number.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

ROBERT PETREMANT, of Boston Highlands,
AZARIAH ELDRIDGE, of Yarmouthport,
JULIAN O. MASON, of Braintree,
Miss H. N. SANDS, of East Somerville,
ALFRED HENRY HERSEY, of Hingham.

The polls were closed at five minutes past twelve o'clock, and the Committee to count the votes reported the names of the officers and members of committees chosen, who, in accordance with the Constitution and By-Laws, were declared by the President to be elected officers and committees of the Society for the year 1879.

Adjourned to Saturday, November 2.

BUSINESS MEETING.

SATURDAY, November 2, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, Vice President JOHN C. HOVEY in the chair.

HENRY C. COOKE, of West Newton, and
JOSEPH S. CHASE, of Malden,

having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society.

Charles M. Hovey, Chairman of the Committee appointed to prepare resolutions in memory of Captain William R. Austin, presented the following:

The Massachusetts Horticultural Society, having learned with deep regret of the death of their late associate, Captain William R. Austin,

Resolved, That in his decease the Society mourns the loss of one of its most honored and trusted members. As Treasurer for a long series of years, he devoted his leisure time and ability to the welfare and best interests of the Society; as a member of various committees, he neglected no duty; as a horticulturist, he originated the now well known method of training pear trees, so successfully practised by him during his life; and as an exhibitor of choice fruits, his contributions attested his enthusiasm and skill as a cultivator.

Resolved, That we highly appreciate the valuable services rendered by Captain Austin to the Society, as well as his life-long devotion to horticultural pursuits — a rare example of untiring industry, and enduring interest, in all the objects and purposes of our association.

Resolved, That the members of the Society condole with the family of their late associate in their irreparable loss.

Resolved, That these resolutions be entered upon the records of the Society, and that a copy be sent to the family of the deceased.

Mr. Hovey said that it was unnecessary to go into any extended remarks on one so well known as Captain Austin. Besides his interest in fruit culture, as shown by the plan which he originated of training trees in the vase or wine glass form, and which he carried to perfection, producing finer specimens of trees, both on quince and pear roots, than any other cultivator, and by his large contributions to our exhibitions, — aside from all this, we recall his services as Treasurer, commencing in the comparatively early history of the Society, and continuing for many years, during all which time he so managed the financial affairs of the Society as to give entire satisfaction. We remember him as a merchant, citizen, husband, and father, and as exemplary in all these relations. We remember his generous hospitalities, and feel that we are greatly indebted to him, and that our loss is irreparable.

Marshall P. Wilder said that he could not allow this occasion to pass without saying one word as a testimonial of respect and affec-

tion for his deceased friend. His acquaintance with Captain Austin commenced fifty years ago, and from that time he had felt a most sincere regard for him. He was full of enterprise; he gave the most assiduous personal care, when it was possible, to the cultivation of his trees. As Treasurer, he was most careful and accurate, and an example to all who shall follow him; and for his services in that capacity, we owe him many thanks. Mr. Wilder spoke of the services of Captain Austin at the time of the erection of the present Hall of the Society, and of his caution, as shown by his hesitation in signing the report in favor of building. He was a townsman of the speaker, and, as a neighbor, he was unobtrusive, kind, and genial.

Vice President Hovey spoke of Captain Austin's services as Chairman of the Committee on Gardens, in which position he knew him best, and said that all would remember him as one who had done as much for the Society in that direction as any other member.

The resolutions were unanimously passed, and the Society adjourned to Saturday, November 16.

BUSINESS MEETING.

SATURDAY, November 16, 1878.

A meeting of the Society was holden to-day at 11 o'clock, agreeably to adjournment, Vice President C. O. WHITMORE in the chair.

The Executive Committee recommended the following appropriations for the year 1879:

For Prizes, ...	$3,050 00
For the Library Committee, . . .	200 00
For the Committee on Publication and Discussion,	150 00

Agreeably to the Constitution and By-Laws these recommendations were laid over until the first Saturday in January.

Adjourned to Saturday, December 7.

BUSINESS MEETING.

SATURDAY, December 7, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, Vice President C. O. WHITMORE in the chair.

W. C. Strong, Chairman of the Committee on Publication and Discussion, read the Annual Report of that Committee, which was accepted and referred to the Committee on Publication. Mr. Strong, also, in reply to an inquiry, stated the plans of the Committee in regard to meetings for discussion during the coming season.

Mrs. H. L. T. Wolcott, Secretary of the Special Committee on Window Gardening, read the Report of that Committee, which was accepted and referred to the Committee on Publication.

On motion of W. C. Strong it was *Voted*, That the thanks of the Society be presented to Mrs. E. Tisdale Talbot, Rev. Rufus Ellis, Rev. George J. Prescott, and the other ladies and gentlemen who have co-operated with the Society in the promotion of Window Gardening, for the care with which they have endeavored to interest the children in Boston and vicinity, in the culture of plants.

Joseph H. Woodford, Chairman of the Committee on Gardens, read the Annual Report of that Committee.

Waldo O. Ross, Chairman of the Library Committee, read the Annual Report of that Committee.

William H. Spooner, Chairman of the Committee on Plants and Flowers, read the Annual Report of that Committee.

Charles N. Brackett, Chairman of the Committee on Vegetables, read the Annual Report of that Committee.

These reports were severally accepted and referred to the Committee on Publication.

The Chairman of the meeting reported from the Executive Committee the list of Prizes to be offered for the year 1879, with the approval of that Committee. Also, from the same Committee, a recommendation that the Society appropriate three hundred dollars for the expenses of the Committee of Arrangements for the year 1879.

Letters were presented from Waldo O. Ross, Charles S. Sargent, and Daniel T. Curtis, declining the positions on the Committee of

Arrangements, Committee on Gardens, and Committee on Vegetables, to which they had respectively been elected.

Voted, That a committee of three be appointed to nominate candidates to fill the vacancies in the committees for the year 1879, caused by these declinations. The Chair appointed as that Committee, C. M. Hovey, James Comley, and C. N. Brackett.

Voted, That the reading of the Report of the Committee on Fruits be postponed for one week.

Adjourned to Saturday, December 14.

BUSINESS MEETING.

SATURDAY, December 14, 1878.

A meeting of the Society was holden to-day, agreeably to adjournment, Vice President C. O. WHITMORE in the chair.

John B. Moore, Chairman of the Committee on Fruits, read the Annual Report of that Committee.

It was moved by N. B. White, and seconded by J. W. Talbot, that the portion of the Report of the Fruit Committee relating to hybrid grapes, be stricken out. After discussion by Messrs. White, Moore, Talbot, J. C. Hovey, B. G. Smith, and James Cruickshanks, the motion was negatived.

The Report of the Fruit Committee was then accepted and referred to the Committee on Publication.

Robert Manning read his Annual Report as Secretary, which was accepted and referred to the Committee on Publication.

The Committee appointed at the last meeting to nominate candidates for the vacancies in the Standing Committees of the Society for the year 1879, made a report which was accepted, and, agreeably thereto, John G. Barker was elected to fill the vacancy in the Committee on Gardens; John Fillebrown was elected to fill the vacancy in the Committee on Vegetables; and E. W. Wood was elected to fill the vacancy in the Committee of Arrangements.

On motion of John B. Moore it was *Voted*, That the Fruit Com-

mittee award the income of the French Fund, to an amount not exceeding thirty dollars per annum, in prizes for apples; and that the number of prizes, time of award, and other details, be at the discretion of the Committee.

Voted, That the subject of baskets for the exhibition of strawberries be referred to the Committee for Establishing Prizes, with full powers.

J. W. Talbot made some interesting remarks on the Influence of the Stock on the Graft, and expressed a desire that the subject should be discussed by the Society. On motion of M. H. Merriam it was *Voted*, That Mr. Talbot be requested to prepare a paper on the subject mentioned by him, to be read at such time as may be fixed by the Committee on Discussion.

The meeting was then dissolved.

REPORT

OF THE

COMMITTEE ON PLANTS AND FLOWERS,

FOR THE YEAR 1878.

By WILLIAM H. SPOONER, CHAIRMAN.

Assuming the duties of his office unexpectedly, and at a time when the work of the year had already commenced, the Chairman of the Flower Committee could hardly hope to bring to the position that careful preparation which alone could enable him to fulfil its requirements; but, while begging your charitable judgment towards his official shortcomings, he need not make the same request with regard to the exhibitions of the past year, which have been unusually good, and several of them much above the average. First among these may be mentioned that of March 2d, with the forced Perpetual Roses, Cyclamens, and Orchids. The Rose Show was particularly noticeable for the increased number of competitors for the larger prizes, although your Committee were disappointed in not seeing more of the new roses introduced in 1875, which was rich in choice varieties and roses of remarkably sweet perfume. The Annual Exhibition was, in many respects, the best ever held by the Society, especially in the collections of fine plants, some of them from parties whom we shall hope to see often hereafter. It is much to be regretted that this exhibition was not more fully appreciated and visited by the public; and we trust the shows of the next season, with the changes proposed in the manner of conducting them, will prove more remunerative to the Society. Many of the smaller weekly shows have been made particularly interesting by contributions of new and rare plants and flowers, which your Committee have endeavored to encourage by suitable recognition.

The display of Cut Flowers, during the whole season, has been unusually good; W. K. Wood has been a constant contributor, taking the first prize every Saturday since June 1st. His stands have been arranged with peculiar taste, and his selections of flowers have been remarkably good; we feel justified in commending such a youthful florist for his successful efforts. Mrs. E. M. Gill has also been a constant contributor to this department of the exhibitions, furnishing excellent assortments, and displaying good judgment in their arrangement, usually securing the second prize. Good displays have also been made during the season by James O'Brien, W. J. Vass, J. B. Moore, and George Craft.

JANUARY 19.

H. H. Hunnewell exhibited a fine plant of *Cœlogyne cristata*, a very beautiful orchid, bearing five or six flowers on a drooping spike, the flowers being about three inches across, and of a pure white color, with a golden blotch on the lip. Its early blooming makes it peculiarly valuable. From James Comley came a novelty for the season in the form of forced Larkspur, particularly well bloomed.

JANUARY 26.

Mrs. A. D. Wood presented *Iris cristata*, which appears admirably adapted for forcing for florist's use.

FEBRUARY 23.

J. B. Moore exhibited very fine Hybrid Perpetual Roses, and James Comley a basket of very superior, mostly new, dark colored roses of the same class.

MARCH 2.

Hovey & Co., and C. M. Atkinson, exhibited choice collections of Camellias. Orchids from F. L. Ames, and C. M. Atkinson, were particularly noticeable. C. B. Gardiner again exhibited a large number of plants of his fine improved strain of *Cyclamen Persicum*, though the individual plants were not quite as large as those he presented last year. Mr. Gardiner received the first and second prizes, to which he was justly entitled, although no competitor contested the honors with him. Considering the simple culture required for this popular flower, it seems surprising that there are not more presented at our shows.

HYBRID PERPETUAL ROSES. — For six plants, James Comley was first with Abel Carriere, Jean Liabaud, Mad. Emilie Verdier, Mad. Herivaux, Royal Standard, and Mad. Prosper Langier. J. B. Moore was second with Captain Christy, Alfred Colomb, Mad. Lacharme, Marquise de Castelane, Lyonnaise, and Richard Wallace. In the competition for three plants, J. B. Moore was first with Mad. Baronne de Rothschild, John Hopper, and Mad. Eugénie Verdier. James Comley was second with Rev. J. B. M. Camm, Duchesse de Vallombrosa, and Jean Soupert. For a single plant, J. B. Moore took the first and second prizes with Mad. Baronne de Rothschild, and Marquise de Castellane. For Tender Roses, James Comley was awarded the prize for twelve cut blooms, offering:

Belle Lyonnaise,
Bon Silene,
Catherine Mermet,
Climbing Devoniensis,
Climbing Hermosa,
Gloire de Dijon,
Isabella Sprunt,
Maréchal Niel,
Niphetos,
Pauline Labonté,
Souvenir de la Malmaison,
Triomphe de Rennes.

Mrs. E. M. Gill exhibited a fine stand of Cut Flowers, well arranged, receiving the only prize. Hyacinths from C. M. Atkinson were remarkably good, — choice varieties, and grown with such skill as to receive all the awards in the several sections.

F. L. Ames exhibited from his choice collection:

Cattleya amethystoglossa.
Cœlogyne cristata major,
Cypripedium Sedeni,
Dendrobium Ainsworthii,
Dendrobium crassinode Barberianum,
Dendrobium heterocarpum,
Dendrochilum glumaceum.
Epidendrum macrochilum album,
Epidendrum macrochilum roseum,
Lælia flava,
Lycaste Skinneri,
Saccolabium curvifolium.

The *Dendrobium Ainsworthii* is a new hybrid, imported from England in 1877, and this was probably the first time it has flowered in the United States.

MARCH 9.

Marshall P. Wilder exhibited a very large plant of azalea Exquisita, fully bloomed, measuring six feet in height and fifteen and a half feet in circumference.

March 16.

James Cartwright sent a well flowered plant of *Dendrobium Wardianum*, said to be the finest Dendrobe in cultivation. It is described as a native of Assam; flowers usually in pairs; sepals and petals white and waxy, tipped with magenta; lip, rich orange. James Comley presented a fine plant of Mad. Baronne de Rothschild rose, grafted upon the Dog Rose.

March 23.

F. L. Ames exhibited a plant of *Dendrobium Falconeri*, a species seldom seen in collections of orchids, and very difficult of cultivation; the plant, though not fully in bloom, was sufficiently so to indicate its great beauty. Also, a fine plant of *Odontoglossum Rossii major*, a desirable orchid from Mexico; the specimen shown was small, but well in flower, evincing skill in cultivation. From James Comley came a small collection of choice roses, among which was especially noticeable the fine new Hybrid Perpetual, Miss Hassard, of delicate pinkish flesh color, large and fine form, uncommonly fragrant, and said to be a free autumnal bloomer.

March 30.

We had from Hovey & Co., rhododendron Countess of Derby, of the Sikkim type; flowers very large, pure white; also, seedling azaleas, promising well. From W. E. Endicott, *Oxalis odorata*, a very pretty variety, of the tuberous rooted type, suited to garden or house culture, blooming throughout the season; color, light lavender.

AZALEA EXHIBITION.

April 6.

Although the number of contributors was not large, the plants shown were particularly good, Marshall P. Wilder, and J. B. Moore, being the principal exhibitors. Col. Wilder's plants were very well bloomed, and several of them well trained. He was the only exhibitor of six named varieties, and was awarded the prize for the following sorts: Fair Ellen, Wilderi, President Édouard de Ghellinck, Variegata, Watsonii, and Criterion. From John B. Moore came some excellent plants in good varieties, well

grown and flowered, although they were not of very large size. For the best six varieties in ten-inch pots, Mr. Moore was first with Superba, Hermann Siedel, Marie Vervaene, Mrs. Turner, L'Éclatant, and François de Vos. Marshall P. Wilder was second with Model, Prince Albert, Decora, Bijou de Paris, Mad. Verschaffelt, and Countess of Beaufort. The question was presented to the Committee whether the last mentioned collection should be ruled out, for the reason that one pot measured ten and three-quarters inches, while in Mr. Moore's collection were two pots measuring ten and one-quarter inches in diameter; the latter were of English manufacture with very thick rims, which increased the width, although undoubtedly made for ten inch pots; but as these were the only collections competing for the prize, the Committee unanimously voted to retain them, and the award was made as above. Exhibitors should bear in mind the rules of the Society in regard to the size of pots in which plants are to be exhibited, as in cases of close competition the Committee must rule out all violating the conditions of the Schedule. The competitors for the prizes for single specimens were J. B. Moore, Marshall P. Wilder, and Hovey & Co., but none of the plants offered were deemed worthy of the first prize. J. B. Moore was awarded the second prize for Decorator, exhibiting, also, in collection, Todmani, Flag of Truce, Stella, Extranei, Juliana, Jean Verschaffelt, Acme, and Mlle. Marie Lefebvre.

Fine Pansies came from James Cartwright, and J. B. Moore; and from Edward Butler an admirable plant of *Cypripedium barbatum grandiflorum*. From George E. Davenport, *Pyxidanthera barbulata*, found in the pine barrens of New Jersey, "a charming little prostrate and creeping evergreen; the rose-colored buds are as pretty, nestling among the copious foliage, as the fully expanded white flowers."

April 27.

James Cartwright exhibited *Dendrobium Parishii* and *Phaius Wallichii;* these are choice species, and the plants were grown with Mr. Cartwright's usual skill. From George E. Davenport came rare early native plants.

May 4.

The Pelargonium show was a complete failure. In view of the very liberal premiums offered by the Society for this class of plants,

it seems remarkable that no competitors should have appeared, although ten days of extreme dampness, followed by two of excessive heat, just before the date of the exhibition, undoubtedly destroyed the beauty of the plants. John Parker presented a remarkably well-grown plant of tricolor pelargonium Peter Grieve, grown in a dwelling-house; an admirable example of successful cultivation. Mr. Parker gives his method of culture as follows:

"The plant exhibited was grown in my dining-room at a south window; I have had it three years. In the summer it was plunged in the garden, and when taken up in the fall was cut back severely and re-potted, the old earth being completely shaken out from the roots. After January, it was enriched once a fortnight with weak liquid manure. I use about a pint of hen droppings, which I first scald with boiling water (to destroy any germs of animal life that may exist in it), and then add about two gallons of water*; I wait for it to settle, and do not use the sediment. Once a week I wash my plants thoroughly by dashing water upon them in the open air, if the weather is mild enough. I also wash the pots as often as once a fortnight, and stir the surface of the earth with a fork. If you would have brilliant tri-colored pelargoniums, keep them near the glass, in the full blaze of the sun, from January to May."

Calceolarias, and Herbaceous Plants, were not shown for prizes, and it is the unanimous opinion of your Committee that it would be better hereafter to fix the exhibition of the latter plants two or three weeks later in the season. From Norton Brothers came seven large and well-grown plants of hydrangea Thomas Hogg. James Cartwright exhibited *Cypripedium hirsutissimum* and *Dendrobium Devonianum*, the latter a very free bloomer and valuable for cut flowers.

May 25.

J. S. Richards brought a good collection of late single and double Tulips, also, some very fine seedling Pansies. From Joseph Tailby there was *Dendrobium chrysotoxum*, a fine orchid, growing about a foot and a half high, throwing up its flower scape from near the top of its stem; color, a light yellow, changing to a darker shade. It is somewhat surprising that Mr. Tailby received this plant from abroad only three days previous to the exhibition, its remarkably

* The Committee consider this a *very powerful* liquid manure, and would advise great caution in its use.

fresh and healthy condition, and fine preservation of bloom, attesting the skill of the shippers, Messrs. Veitch, of Chelsea, England, in the packing of plants. It is gratifying to notice the increased attention of our commercial cultivators to the rarer and more delicate species of plants. Prof. C. E. Hamlin, of Waterville, Maine, sent, by J. W. Merrill, a beautiful specimen of that rare plant, *Calypso borealis*.

May 18 and 25.

F. B. Hayes exhibited beautiful collections of Rhododendrons, many of them new varieties.

June 1.

Marshall P. Wilder was the only competitor for the premiums for Tree Pæonies, and received the first prize for some very large flowers, among them Louis Van Houtte and Louis Mouchelet, the former measuring nine inches in diameter; also Lactea, Neumanni, and Purpurea, and seedlings grown by the late Dr. Kirtland. From H. H. Hunnewell came a stand of forty-eight varieties of new and rare Rhododendrons, for which the Society's Silver Medal was awarded. The collection was well worthy the highest of the Hunnewell premiums, but as the giver declines competing for his own special prizes, and as the Society offers but one prize for rhododendrons, and that for a general collection, the Committee were unable to confer a higher award.

Mr. Hunnewell also exhibited the new and beautiful *Azalea mollis*, in several varieties, with much larger flowers than the common Ghent sorts. Hovey & Co., and B. G. Smith, exhibited excellent collections of Hardy Azaleas; from the latter the following varieties: Baron George Pyke, Concinna, Gloire de Belgique, Ne Plus Ultra, Princeps Speciosa, and Punicea. Hovey & Co. showed a single truss of flowers of a remarkably beautiful variety, Superbissima, of flaming orange color.

H. H. Hunnewell sent two new June flowering clematis; Fair Rosamond,—flowers blush white, with a slight tinge of red up the centre of each sepal; and Stella,—light violet, a deep reddish brown in the centre of each sepal, both of them delicately fragrant. Also, *Andromeda Catesbœi*, a rare species. Joseph H. Woodford also sent a beautiful assortment of hardy flowering clematis. John L. De Wolf exhibited a choice collection of seedling Pansies in many

colors—one of the best assortments shown this season. Joseph Tailby showed *Cattleya Mossiæ*, a beautiful free flowering species, about one foot in height, blooming from March to August.

JUNE 8.

F. B. Hayes exhibited very beautiful varieties of Rhododendrons and hardy shrubs, and George E Davenport, *Cypripedium spectabile* and *Hudsonia tomentosa*.

ROSE SHOW.

JUNE 19.

This proved much better than was anticipated from the uncommonly cool weather preceding it, which retarded the roses, and tended to mar their loveliness. President William Gray, Jr., J. B. Moore, John C. Chaffin, J. S. Richards, M. D. Spaulding, and E. W. Wood were the principal exhibitors. The first prize for the best twelve varieties was awarded to John C. Chaffin for

Baron de Bonstettin,	Louis Van Houtte,
Baronne de Rothschild,	Mad. Charles Crapelet,
Captain Christy,	Mad. Victor Verdier,
Charles Lefebvre,	M'lle. Eugénie Verdier,
Countess of Oxford,	Mons. Boncenne,
Étienne Levet,	Paul Neron.

Mr. Chaffin was the only contributor who furnished a list of his roses to the Committee.

President Gray was the only competitor for the premium on varieties sent out since 1875. Moss Roses were not as good as those of previous years. Very fine Maréchal Niel came from several contributors, M. D. Spaulding taking the first prize.

There was no competition for the prizes for Gloxinias.

F. L. Ames exhibited six plants from his superb collection of Orchids, as follows: *Dendrobium McCarthiæ*, *Brassia verrucosa*, *Cypripedium caudatum*, *Cypripedium Dominianum*, *Cypripedium niveum*, and *Thunia Bensoniæ*. The most noticeable of these was *Cypripedium caudatum*. The long, pendant, linear, wavy tails into which the petals are developed, and from which the specific name is derived, are very extraordinary. They are about eighteen

inches in length, and are quite short when the flower begins to open, but grow at the rate of from four to five inches a day. Mr. Ames also showed *Utricularia montana*. Sweet Williams were very good from several contributors. George E. Davenport, E. H. Hitchings, and Mrs. C. N. S. Horner, presented rare native plants. From Curtis, Cobb & Washburn, came six strikingly beautiful varieties of Japanese Maples, viz.: *Acer polymorphum reticulatum* (white), ground very distinct; *A. p. album variegatum*, *A. p. versicolor*, *A. p. sanguineum*, *A. p. roseum marginatum*, and *A. p. dissectum atropurpureum*.

On this occasion, and also on the 22d and 26th of June, J. R. Brewer exhibited *Andromeda speciosa*, a beautiful species bearing racemes of pure white flowers on the upper portion of the stem. The plants were imported by Mr. Brewer about twelve years ago as *A. floribunda*, but proved far superior to that species, and, with him, perfectly hardy.

It would seem that the Rose Exhibition should be made to yield some revenue to the Society, as it can be rendered peculiarly attractive to the public.

STRAWBERRY SHOW.

June 26.

President William Gray, Jr., J. B. Moore, and J. S. Richards, exhibited very fine collections of Hybrid Perpetual Roses. Mr. Moore's were made particularly interesting by being named.

F. L. Ames showed *Lælia majalis*, a grand orchid from Mexico; the specimen was the first ever exhibited in this country; color, beautiful rose, the lip striped and spotted with chocolate. Williams says it is "the finest of the genus, blooming upon the young growth, and lasting five or six weeks in beauty."

Delphiniums were not as good as in some previous seasons; we missed Ex-President Parkman's fine collection. E. H. Hitchings exhibited *Osmunda cinnamomea frondosa*, an unusual form, nearly all the fronds being fertile; also, *Hottonia inflata*, or Water Violet, a singular plant. From J. C. Hovey, Richardson's herbaceous pæonies, Grandiflora, Rubra Superba, and Dorchester—remarkably fine flowers. Miss E. M. Harris presented a most artistically arranged Table Design, composed chiefly of the flowers of native plants.

JUNE 29.

Francis Parkman exhibited a beautiful collection of seedlings from *Iris Kœmpferi* (fibrous rooted); the seed was received by him last season from Baden-Baden. Various shades of color were represented, from pure white to deep purple, light rose, mottled or bizarre, dark maroon, and yellow blotched at the base. These irises are perfectly hardy, and must prove a great acquisition.

JULY 6.

A. P. Calder presented *Nymphœa odorata* var. *rosea*, very beautiful; color, clear rose or pink; and E. L. Beard, *Odontoglossum cirrhosum*, *Zygopetalum rostratum*, and *Vanda cærulea*.

JULY 13.

We had one of the best miscellaneous exhibitions. From J. B. Moore, J. S. Richards, A. McLaren, and J. Nugent, came very fine Hollyhocks; from Messrs. Nugent and Richards, superior Carnations and Picotees; from J. B. Moore, fine Gloxinias, and from J. Tailby a very fine, well grown plant of *Brassia verrucosa*. Also, from E. L. Beard several plants of *Torenia Fournieri*, a very desirable species, almost perpetual blooming. From F. Parkman, a seedling Lily, a cross between *L. longiflorum* and *L. auratum*. The first year of its blooming showed no perceptible change; the plant formed seed very sparingly, but what was produced was sown, and the result is an increased vigor of the plant. The flower partakes largely of the form of *L. longiflorum*, but has the tube swollen; the color of the anthers is changed to a bright orange. Your Committee did not deem the improvement of sufficient importance to merit special commendation, but hope it may lead to a change of color in this beautiful class of lilies.

JULY 20.

James Comley brought a small plant of a native Maple, with clearly striped foliage, found by him in a swamp near Lexington; if he succeeds in growing the plant, and retaining its remarkable leaf coloring, it will prove a valuable addition to our hardy ornamental foliaged trees. From J. R. Brewer, *Acer Colchicum*, from Japan; probably perfectly hardy; the growing tips of the stems are prettily

bronzed; foliage very striking, resembling that of an English Ivy in form.

Very fine Hollyhocks were shown by J. B. Moore, J. S. Richards, E. Sheppard, and James Nugent; we are glad to note an increasing interest in this showy plant. Your Committee would suggest that hereafter hollyhocks presented for prizes should be shown in rose boxes.

From F. L. Ames, a beautiful plant of *Cattleya Dowiana*, flowers very large, of a nankeen color, the lip being rich velvety purple, streaked with gold. "This is, probably, the most beautiful of the many gorgeous forms which the genus *Cattleya* has produced."

There was no competition for the prizes for Greenhouse Flowers; the third prize was awarded to the only exhibitor.

JULY 27.

F. B. Hayes sent *Aralia* (*Dimorphanthus*) *Mandshurica*, a new hardy ornamental shrub from Japan, with creamy white flowers; probably perfectly hardy. It is described and figured in the "Gardener's Chronicle," Vol. X. (N. S.), p. 592.

AUGUST 3.

The exhibition was not as good as usual; of Balsams, only two stands were shown, and of Stocks only one, neither of which was considered worthy of the first prize. There were but two competitors for the prizes for Annuals and Perennials. Mrs. C. N. S. Horner placed in the stands a very fine collection of native flowers, with their names, which add very greatly to the value of such an exhibition; among them several rare sorts were noticeable, viz.: *Utricularia resupinata*, *U. cornuta*, *Lobelia Dortmanni*, *Lycopodium inundatum*, *Sabbatia chloroides*, and *Asclepias verticillata*. From F. Parkman, one of his excellent seedling phloxes, Mrs. Derby, a remarkably fine variety, of great vigor, with very large flowers, having a rich carmine eye, shading to white at the outer edge of the petals; of very branching habit, bringing out the individual flowers prominently; a very early flowering variety of the autumnal type of phlox.

From Miss S. W. Story, *Lilium Leichtlinii*, of the martagon type, the divisions of the perianth rolling back from near the base;

color, deep bright yellow, profusely spotted with purplish red dots. The plant is apparently of slender growth, from two to three feet high; coming from Japan, it may prove hardy. It was exhibited at the Hall, September 2d, 1876, but does not appear to have been introduced to cultivation extensively. From Miss E. M. Harris, very fine specimens of *Lobelia cardinalis*, both the common and var. *alba*, found on the borders of Stony Brook.

From E. H. Hitchings, the following rare native plants: *Orchis blephariglottis*, *Orchis tridentata*, *Sarracenia purpurea*, *Cornus Canadensis* (ripe fruit and flower), *Sabbatia chloroides* (white and red), *Goodyera repens*, *Cassia chamæcrista*, and *Polygala polygama*.

AUGUST 10.

The display of Perennial Phloxes was not equal to that of former years, the extremely wet weather of the previous week having injured the beauty of the flowers. J. B. Moore, and A. McLaren, were the only contributors, the former taking the first prize with the following varieties:

Chimene,	Mad. Langier,
Croix d'Honneur,	Mad. Moissette,
Czarina,	Michel Buchner,
Député Berlet,	Saison Lierval,
Heloise,	Souvenir de Berryer.

The competition for the prizes for Petunias was much larger than usual, George Craft, James Nugent, Mrs. A. D. Wood, and Mrs. W. Latham, contributing fine collections. The Committee were compelled to rule out the first three exhibits, as they each contained one spike more in a single bottle than the Schedule specified, and Mrs. Latham received the only prize awarded.

W. T. Andrews presented a few seedling flowers of the new double, large-flowering, fringed petunia. This was sent out last year by E. Benary, the eminent German seedsman. Mr. Andrews has given his petunia the name of Miss Anna Bigelow. This strain of seed is undoubtedly one of the finest ever presented to the horticultural world; its flowers are very large—Mr. Benary says, "as large as double garden poppies," with all varieties of brilliant color.

AUGUST 17.

The display of Gladioli was in most respects very good, although some growers complained that the prize day was a week too early, heavy rains having injured the flowers. Good collections were shown by A. McLaren, J. S. Richards, M. H. Merriam, H. Gleason, and G. Crafts; several fine new French varieties were on the table.

E. L. Beard contributed the following very desirable free-flowering orchids: *Disa grandiflora*, *Odontoglossum Bictonense*, and *Oncidium ornithorhynchum*. Joseph Tailby showed several very fine seedling carnations, grown from seed of La Pureté and Boule de Neige; several of them will undoubtedly prove valuable for florists' use. From Miss E. M. Harris, there was a Table Design composed of native ferns, arranged with her usual excellent taste.

AUGUST 24.

Asters were not as well represented as usual, some growers complaining that the prize day was too early, but very good stands were exhibited by E. Sheppard, J. B. Moore, and A. McLaren, who received the three prizes in the order of their names.

T. Putnam Symonds brought a remarkable spike of flowers of *Lilium auratum*, grown upon a stem seven feet high, measuring at the base an inch and a half in diameter, widening at the top to three inches, and consisting of several smaller stems, merged into one broad, flat stem. This bore, when exhibited, one hundred and forty expanded flowers, probably the largest number ever seen in this country or England, on one stem, though the individual flowers were rather smaller than the type. We shall be curious to notice the condition of the plant next season, and to know whether such profuse blooming will kill it, or whether it can continue its wonderful development. This lily has proved very unreliable with most cultivators in this country, blooming for a few years very luxuriantly, and dying suddenly without apparent cause. J. F. C. Hyde sent a seedling gladiolus, pure white, some of the lower divisions striped with pink.

AUGUST 31.

Hovey & Co. showed a very fine group of *Lilium Melpomene*. Verbenas were very well exhibited by six competitors, Messrs.

Sheppard, Moore, and McLaren, obtaining the prizes. James Comley showed a seedling verbena, which promises to be a desirable sort; truss, large; color, bright crimson, very dark centre, and a very large eye. From Macey Randall, very good dahlias. Norton Brothers exhibited a collection of excellent asters in pots. There were fine spikes of gladioli from G. Craft, J. Cartwright, and J. S. Richards.

September 7.

The exhibition of Zinnias, if not the best, was probably the largest ever made before the Society. There were seven competitors in the class of twenty flowers, and nine in that of ten flowers, but again the rains of the few previous days had damaged the flowers, many of them being coarse, and hardly up to the standard. J. B. Moore took the highest prize; his flowers were arranged with his usual good taste in the combination of colors. From Hovey & Co., there were two small plants of the new *Coleus multicolor*, "the leaves deeply cut, at the edges undulating; its green color is splashed and spotted with crimson reddish rose, and the young leaves with yellow."

ANNUAL EXHIBITION.

September 17, 18, 19, and 20.

As a whole, this was the best ever made by the Society.

Greenhouse Plants.—The exhibitors of twelve were H. H. Hunnewell, S. R. Payson, William Gray, Jr., and Hovey & Co., Messrs. Hunnewell and Payson taking the first and second prizes. Messrs. Hovey & Co.'s collection was remarkably fine, as was also that of President Gray. Mr. Hunnewell's twelve plants were as follows: —

Alocasia metallica,
" *Veitchii*,
Croton pictum,
Eurya latifolia, var.,
Ficus Parcellii,
Hydrangea speciosa,
Maranta eximia,
" *Makoyana*,
" *pardina*,
Pandanus graminifolius,
Phyllotœnium Lindenii,
Sphœrogyne latifolia.

Great credit is due to Mr. Harris, Mr. Hunnewell's accomplished gardener, for his skill in the grouping of his plants.

Mr. Payson was second with —

Alocasia macrorhiza, var.,	*Dœmonorops fissus*,
" *Sedeni*,	*Dracœna Mooreana*,
Anthurium crystallinum,	*Euterpe edulis*,
Cocos Weddelliana,	*Maranta Veitchii*,
Croton variegatus,	*Pandanus Veitchii*,
Cyanophyllum magnificum,	*Paullinia thalictrifolia*.

SPECIMEN PLANT.—The first prize was awarded to President Gray for *Pandanus reflexus*, and the second to Hovey & Co., for *Cycas revoluta*.

SPECIMEN FLOWERING PLANT.—Hovey & Co. took both prizes; the first with *Allamanda Hendersoni*, and the second with *Peristeria elata*, or Dove Flower.

VARIEGATED LEAVED PLANTS.—The first prize was taken by H. H. Hunnewell, with *Croton cornutum*, *C. Johannis*, *C. Mooreanus*, *C. Weismanni*, *Maranta bicolor*, and *Pandanus Veitchii*. The second prize by President Gray, with *Agave schidigera*, *Ananassa sativa var.*, *Croton interruptum*, *Cucurligo variegata*, *Phormium tenax var.*, and *Yucca quadricolor*. Messrs. Hovey & Co. were also competitors iu this class with fine plants.

For the best single specimen, not offered in any collection, the first prize was awarded to Hovey & Co., for *Phormium Colensoi*.

CALADIUMS.—President Gray was first, with finely grown, compact plants of Alfred Bleu, Beethoven, Chantini, Meyerbeer, Triomphe de l'Exposition, and Wightii.

FERNS.—The best six were from J. Warren Merrill, as follows: *Dicksonia Barometz*, *D. Schiedei*, *Gleichenia circinata glauca*, *G. dicarpa*, *Oleandra nodosa*, and *Polypodium peltideum*. The second prize was awarded to Hovey & Co. for *Adiantum decorum*, *A. trapeziforme*, *Alsophila Van Geerti*, *Asplenium Fabianum*, *Davallia Mooreana* and *D. Tyermanni*.

For the best three Ferns to J. W. Merrill for *Aglamorpha Meyeriana*, *Nephrodium giganteum*, and *Polypodium spectrum*. The second to President Gray for *Adiantum cuneatum elegans*, *A. gracillimum*, and *Niphobolus Lingua cristata*.

ADIANTUMS.—For six varieties, the first prize was awarded to S. R. Payson for remarkably well grown plants of *amabile*, *cune-*

atum, *Farleyense*, *formosum*, *gracillimum*, and *macrophyllum*. The second to President Gray for *assimile*, *cultratum*, *cuneatum*, *excisum multifidum*, *Lindeni*, and *Peruvianum*.

LYCOPODS were not as good as usual; President Gray was the only exhibitor, and was awarded the second prize for *apothecum*, *apus*, *serpens*, *Karstenianum*, *viticulosum*, and *retusum*.

DRACÆNAS.—The best six named varieties were exhibited by H. H. Hunnewell, in very choice plants of *amabilis*, *Baptistii*, *magnifica*, *Mooreana*, *Weismanni*, and *Youngii*. The second prize went to Hovey & Co. for very fine plants of *amabilis*, *ferrea*, *Hendersoni*, *imperialis*, *Shepherdii*, and *Youngii*.

PALMS.—For the best single specimen, the first prize was awarded to S. R. Payson for *Pritchardia Pacifica*,—a very large plant of this remarkably robust growing species; the leaves are very large; color, rich dark green. The second prize to Hovey & Co., for *Phœnix reclinata*, of which Williams says, "it is a fine greenhouse palm, and will stand uninjured in the sub-tropical garden in summer."

PITCHER PLANTS were not quite as good as we could wish to see. President Gray was the only exhibitor, taking the second prize with *Sarracenia purpurea*, *S. psittacina*, and *S. rubra*.

AGAVES.—Very admirable plants were exhibited by Hovey & Co., who took the first prize with *Americana medio-picta*, *applanata*, *Besseriana candida*, *heteracantha cœrulescens*, *hystrix*, and *xylinacantha*.

No exhibit was made of Cacti or Succulents.

NEW POT PLANT, never before shown at any exhibition of the Society. This prize was awarded to S. R. Payson for *Maranta Massangeana*, "a very elegant and distinct novelty, of dwarf compact habit; leaves, ovate; ground color, olive green, beautifully blotched with brown; up the centre of the leaf there is a broad irregular band of white. The primary veins are very prominent, and of the same color." Hovey & Co. presented, in competition, *Dracœna Goldieana*. The plant being of recent importation was not in such a condition that the Committee could judge of its merits, but is highly commended by its European introducers.

GLADIOLI.—The exhibit was not as large as in some previous years; George Craft and J. S. Richards were the only competitors, the former receiving the first prize for a stand of very choice flowers, but with defects in their arrangement, the intro-

duction of cannas, and other foliage than that of gladioli, marring the general effect. The gladiolus being a plant of sparse foliage the eye naturally seeks the well developed spike of flowers, without regarding other features. J. S. Richards was second with a fine collection, lacking somewhat in dark colors, but remarkably well arranged. James Cartwright and E. Sheppard also exhibited gladioli. Mr. Cartwright has several times during the season shown uncommonly good flowers.

DAHLIAS.—The exhibit was better than for many previous years. For twelve blooms, H. Grundel was first with

Beauty of Wilts,	Julia Davis,
Charles Breckus,	Lady Gladys Herbert,
Duchess,	Princess,
Fanny Stewart,	Thomas Goodwin,
Gipsy King,	Vesuvius,
John McPherson,	Victory.

S. G. Stone was second with

Duke of Edinburgh,	Monarch,
Eva,	Mrs. Harris,
James Crocker,	Orient,
John Standish,	Ovid,
Maid of Essex,	Princess,
Miss Saunders,	William Lucas.

Hovey & Co. were third with

Chief,	Picotee,
George Goodhall,	Princess,
James Crocker,	Prospero,
John Lamont,	Rev. J. B. M. Camm,
King of Beauties,	Thomas Goodwin,
Peri,	William Lucas.

For six blooms, the first prize was given to S. G. Stone for Cremorne, Duchess of Cambridge, Lord Derby, Mrs. Edwards, Peri, and Queen of Beauties. The second to S. G. Stone for Le Phare, Lettie Coles, Lord Hawke, Picotee, Queen Mab, and Thomas White. The third to James Nugent for Delicata, John Standish, Lord Derby, Peri, Primrose Perfection, and Snow Fleece.

For the best single bloom, the first prize to S. G. Stone, for Henry Walton, and the second to Macey Randall, for John Standish.

LILIPUTIANS were noticeably fine; Macey Randall, J. F. Marble, and S. G. Stone, were the exhibitors.

Cut Flowers.—There was a deficiency in this department, possibly caused by the reduction in the number of prizes; W. K. Wood, Mrs. E. M. Gill, and James Nugent, were the only competitors, and the three prizes were awarded in that order.

Baskets of Flowers.—Those from Mrs. S. Joyce and Miss S. W. Story were particularly good; so closely contested was this prize that the Committee had considerable difficulty in deciding on the awards.

Rustic Stand.—The only exhibitor was W. J. Vass, with a well designed stand, filled with very choice plants.

Table Designs.—These were all well executed by Mrs. A. D. Wood, Mrs. E. M. Gill, and C. H. Hovey & Co.; Mrs. Wood taking the first, and Mrs. Gill the second prize.

New and Miscellaneous Plants, etc.—F. L. Harris presented a new seedling *Dracæna*, No. 20, which he has named *Harrisii*, a cross between *D. Regina* and *D. stricta;* a very robust growing plant; color, a beautiful dark green, with a more generally variegated habit than *Regina*, in this respect resembling *stricta*, though more distinct, the variegation on the upper leaves extending almost to the midrib. The Committee awarded Mr. Harris a Silver Medal.

Hovey & Co. showed *Lilium Neilgherrense*, a new variety from India; the plant being recently imported was not in the best condition to show its true merit; foreign descriptions pronounce it the most magnificent of all Indian lilies. It grows eight thousand feet above the level of the sea.

F. B. Hayes presented a small plant of *Pinus Massoniana var.*, a recent introduction from Japan by Thomas Hogg, which promises to be a great acquisition; probably perfectly hardy; the coloring is peculiarly beautiful, varying from white to green and yellow. Also, a rare specimen, from Japan, of *Castanea aurea var.*, the leaves distinctly marked with delicate white and green; it is of vigorous habit, and perfectly hardy.

W. C. Strong & Co. exhibited a young Pear tree upon the *Cydonia Japonica* stock. This union is a new experiment, and it is hardly time to judge of its practical usefulness. The same contributors also presented thirty-three varieties of ornamental foliage of hardy trees and shrubs, including Maple, Elm, Beech, Birch, Peach, Hazel, Golden Ash, Golden Spiræa, etc.

J. F. M. Farquhar exhibited a design for a garden, measuring

five feet two inches in length, and four feet nine inches in width, arranged in generally good taste, and forming quite a prominent feature of the exhibition. The design was remarkably well adapted to the purpose, the chief defect being in some of the proportions, and in a slight want of harmony in the combinations of color in planting.

October 5.

F. B. Hayes showed foliage of a plant received by him as *Polygonum Japonicum*,—a rapid growing, hardy, climbing plant, with variegated foliage, in shades of green, gold and mixed colors. Also, *Weigelia alba*, pure white and a profuse bloomer. Miss S. W. Story exhibited *Eulalia Japonica*, a lovely Japanese ornamental grass, with variegated foliage. It attains the height of six or seven feet, and is crowned in the autumn with graceful plumes of pale purple flowers, rivalling those of the *Gynerium* in beauty. Retaining its flowers persistently in the winter, it is admirably adapted for decorative purposes. From W. C. Strong came very finely tinted foliage of the new weeping cut-leaved Maple.

CHRYSANTHEMUM SHOW.

November 9.

The collection of plants shown was not as large as that of last year, but was remarkably good. Messrs. F. L. Ames and H. L. Higginson were the exhibitors of the larger classes. Mr. Ames' plants were well flowered, and the varieties well chosen, but the grouping lacked that harmony of color which adds so much to the effect of a stand of flowered plants. Mr. Higginson's plants were particularly well grown, and were grouped with good effect, but deficient in variety of color.

In the general display of cut blooms, E. Sheppard presented a fine selection in the following varieties:

Alarm,
Aurea,
Boadicea,
Bob,
Bronze Jardin des Plantes,
Cossack,
Durnflet,
Duchess of Manchester,
Duke of Edinburgh,
Duke of Roxburgh,

Ellen Turner,	Mrs. George Rundel,
Empress of India,	Mrs. Haliburton,
Erecta Superba,	Mrs. Sharp,
Fair Maid of Guernsey,	Magesta Violet,
Gen. Canrobert,	Nellie,
Golden Circle,	Ne Plus Ultra,
Goldlight,	Niobe,
Helen McGregor,	Prince of Wales,
Jardin des Plantes,	Progne,
Julia Lagravere,	Purple King,
La Brunette,	Rifleman,
Lady Slade,	Rosabella,
La Fiancée.	Rose Perfection,
La Grande,	Rosetta,
Laurinda,	Snowball,
Mad. de Vatry,	Venus,
Maroon Model,	Volunteer,
Mount Etna,	White Venus,

Mr. Higginson was the only exhibitor of large-flowering varieties, and received the first prize. Mr. Ames took the first prize for Pompons, with Gen. Canrobert, La Fiancée, Ninette, Drunflet, Mad. Vatry, and Mad. Milliez.

There were good stands of Chrysanthemums from Mrs. E. M. Gill, James Nugent, and J. B. Moore. Single specimen plants were shown by E. Sheppard, F. L. Ames, H. L. Higginson, and W. J. Vass.

Mr. Ames contributed a remarkably fine plant of *Nepenthes Chelsoni*, a new variety, with very large pitchers, of light green; the growth of the plant evinced the skill of his gardener, Mr. Robinson. We hope to see more of these curious and interesting plants presented for competition. From the same source came some very fine orchids and other plants as follows: *Cattleya labiata*, *Cypripedium Harrisianum*, *C. Sedeni*, *Oncidium Barkeri*, *Capsicum Princess of Wales*, and *Sonerila Hendersonii*, the last "a stove-plant of great beauty," leaves dark olive green, spotted with pearly white; under surface marbled and veined with crimson; flowers bright lilac rose.

E. Sheppard brought cut blooms of some superior Pelargoniums, as follows:

Atlanta,	Gelein Souagie,
Cleopatra,	Helen Dick,
Cornet,	King Albert (ivy-leaved),
Député Varroy,	La Claire,
Dr. Guigneau,	Mad. Thibaut,
Édouard Lequin,	Marie Bertier.

J. B. Moore contributed a pretty vase of flowers, including beautiful blooms of *Lapageria rosea* and *alba*.

It is greatly to be regretted that the necessity for retrenchment in the expenses of the Society, compels the adoption of very radical changes in the prize Schedule, and the reduction in the number of exhibitions for the coming season; but we trust the pecuniary deficiency will not be long continued, and that by united and energetic action on the part of exhibitors and standing committees, such drawbacks may be entirely overcome.

This Committee unanimously believe that a grand semi-centennial exhibition and celebration would be most conducive to awakening interest, and showing the progress of the Society in its half-century of life.

The amount of money prizes awarded by the Committee is $2,068, out of the appropriation of $2,250, leaving a balance of $182. Prizes were offered from the income of the Hunnewell Funds to the amount of $119, of which $36 was awarded.

This report was approved by the Committee, December 7, 1878.

WM. H. SPOONER, *Chairman.*

PRIZES AND GRATUITIES AWARDED FOR PLANTS AND FLOWERS.

JANUARY 5.

Gratuities:—

James Comley, Cut Flowers,	$1 00
J. B. Moore, " "	1 00
C. M. Atkinson, " "	1 00

JANUARY 12.

Gratuity:——

James Comley, Cut Flowers,	1 00

JANUARY 19.

Gratuities:—

James Comley, Cut Flowers,	2 00
Mrs. E. M. Gill, " "	1 00

JANUARY 26.

Gratuity:—

Mrs. A. D. Wood, *Iris cristata*,	2 00

FEBRUARY 2.

Gratuities:—

Mrs. A. D. Wood, Cut Flowers,	1 00
Mrs. E. M. Gill, " "	1 00
A. P. Calder, Lilacs,	1 00
J. B. Moore, fine Roses,	1 00
L. H. Foster, Roses,	1 00
C. B. Gardiner, "	1 00

FEBRUARY 9.

Gratuities:—

James Comley, Cut Flowers,	2 00
Mrs. A. D. Wood, " "	1 00
Mrs. E. M. Gill, " "	1 00
Mrs. S. Joyce, " "	1 00

FEBRUARY 16.

Gratuity:—

C. B. Gardiner, Cyclamen,	2 00

FEBRUARY 23.

Gratuities:—

Mrs. E. M. Gill, Cut Flowers,	$2 00
Mrs. S. Joyce, " "	2 00
Mrs. A. D. Wood, " "	2 00
J. B. Moore, fine Roses,	2 00
James Comley, new Roses,	4 00

MARCH 2.

CAMELLIAS.—Display of named varieties, not less than twenty blooms, Hovey & Co.,	5 00
Second, C. M. Atkinson,	4 00
ORCHID, WINTER BLOOMING.—Single plant, F. L. Ames,	6 00
Second, C. M. Atkinson,	4 00
Third, F. L. Ames,	2 00
PARLOR BOUQUETS.—Pair, James Nugent,	5 00
CYCLAMENS.—Six pots, C. B. Gardiner,	6 00
Second, C. B. Gardiner,	5 00
CUT FLOWERS.—Fifty bottles, Mrs. E. M. Gill,	5 00
HYBRID PERPETUAL ROSES.—Six plants, of distinct varieties, James Comley,	10 00
Second, J. B. Moore,	8 00
Three plants, of distinct varieties, J. B. Moore,	6 00
Second, James Comley,	5 00
Single plant, J. B. Moore,	4 00
Second, " "	3 00
Third, James Comley,	2 00
Twelve blooms, of twelve distinct named varieties, J. B. Moore,	8 00
Six blooms, of six distinct named varieties, J. B. Moore,	4 00
TENDER ROSES.—Twelve blooms, of twelve distinct named varieties, James Comley,	6 00
Six blooms, of six distinct named varieties, James Nugent,	4 00
HYACINTHS.—Twelve distinct named varieties, in pots, C. M. Atkinson,	6 00
Six distinct named varieties, in pots, C. M. Atkinson,	4 00
Three distinct named varieties, in pots, C. M. Atkinson,	2 00
AMARYLLIS.—Three varieties, in pots, J. B. Moore,	4 00

Gratuities:—

J. B. Moore, Roses, in pots,	3 00
James Comley, Rose Monsieur Fournier,	1 00
" " new Roses,	3 00
Hovey & Co., Seedling Azaleas,	1 00
Mrs. A. D. Wood, Basket of Flowers,	3 00
C. B. Gardiner, Cyclamens,	10 00
F. L. Ames, collection of Orchids,	15 00

Hovey & Co., Camellias, in pots,	$2 00
" " Cut Camellias,	1 00
A. Whittet, collection of Heaths,	5 00
Mrs. E. M. Gill, collection of Cinerarias,	3 00
James Nugent, Cut Flowers,	2 00

MARCH 16.

Gratuity:—

James Cartwright, *Dendrobium Wardianum*,	3 00

MARCH 30.

Gratuities:—

W. J. Vass, Roses,	1 00
Hovey & Co., Rhododendron Countess of Derby,	1 00
Mrs. A. D. Wood, Basket of Flowers,	1 00
Mrs. S. Joyce, Cut Flowers,	1 00
James Comley, " "	1 00

AZALEA EXHIBITION.

APRIL 6.

INDIAN AZALEAS.—Six named varieties, in pots, Marshall P. Wilder,	25 00
Six named varieties, in not exceeding ten-inch pots, John B. Moore,	10 00
Second, Marshall P. Wilder,	8 00
Single specimen, the second prize to John B. Moore,	6 00
CINERARIAS.—Six varieties, in pots, E. Sheppard,	6 00
PANSIES.—Six distinct varieties, in pots, James Cartwright,	4 00
Second, J. B. Moore,	3 00
BASKET OF FLOWERS.—Best arranged, James O'Brien,	4 00
Second, Mrs. A. D. Wood,	3 00

Gratuities:—

Edward Butler, *Cypripedium barbatum grandiflorum*,	5 00
C. B. Gardiner, Cyclamen and Heath,	2 00
Hovey & Co., Azaleas,	5 00
James Comley, Pelargoniums and Azaleas,	2 00
George E. Davenport, *Pyxidanthera barbulata*,	1 00
James O'Brien, Pansies,	1 00
Miss S. W. Story, Floral Design,	2 00
W. J. Vass, fine Cut Flowers,	6 00
J. B. Moore, " "	3 00
James Comley, " "	3 00
Mrs. E. M. Gill, " "	2 00
J. B. Moore, collection of Azaleas,	4 00
James Nugent, Cut Flowers,	2 00

APRIL 27.

Gratuities:

James Cartwright, *Dendrobium Parishii*,	$1 00
" " *Phaius Wallichii*,	2 00
George E. Davenport, rare early Native Plants,	1 00

MAY 4.

TABLE DESIGN.—Mrs. E. M. Gill,	4 00
TULIPS.—Twenty-five named flowers, J. S. Richards,	5 00

Gratuities:—

James Cartwright, *Cypripedium hirsutissimum*, and *Dendrobium Devonianum*,	5 00
J. S. Richards, Pansies,	1 00
B. G. Smith, "	1 00
Mrs. E. M. Gill, "	1 00
Mrs. S. Joyce, Basket of Flowers,	3 00
Mrs. A. D. Wood, " " "	3 00
John Parker, Pelargonium "Peter Grieve,"	4 00
W. J. Vass, fine Cut Flowers,	3 00
J. B. Moore, " " "	3 00
James Nugent, Cut Flowers,	2 00
Mrs. S. Joyce, " "	1 00
E. H. Hitchings, Native Flowers,	1 00
George E. Davenport, " "	1 00
Mrs. E. M. Gill, " "	1 00
E. Sheppard, Display of Tulips,	2 00
J. S. Richards, " "	3 00
Norton Brothers, Hydrangea Thomas Hogg (very fine),	10 00
Mrs. E. M. Gill, " " "	2 00

MAY 11.

Gratuities:—

Francis B. Hayes, Hardy Azaleas,	1 00
Mrs. E. M. Gill, Cut Flowers,	1 00
George E. Davenport, Native Flowers,	1 00
Charles Wm. Jenks, Native Flowers,	1 00

MAY 18.

Gratuities:—

Mrs. A. D. Wood, Basket of Flowers,	2 00
Mrs. S. Joyce, Cut Flowers,	1 00
Mrs. E. M. Gill, " "	1 00
B. G. Smith, Pansies,	1 00
Francis B. Hayes, new Azaleas and Rhododendrons,	2 00

MAY 25.

Gratuities: —

Joseph Tailby, *Dendrobium chrysotoxum*,	$3 00
B. G. Smith, Hardy Azaleas,	2 00
M. H. Merriam, Hardy Azaleas,	1 00
Francis B. Hayes, fine Rhododendrons,	2 00
James Comley, Sikkim Rhododendrons,	1 00
J. S. Richards, collection of Tulips and Pansies,	4 00
F. Parkman, Seedling Clematis,	1 00
Marshall P. Wilder, fine Tree Pæonies,	3 00
O. B. Hadwen, Pansies,	1 00
Mrs. E. M. Gill, Cut Flowers,	2 00
Mrs. S. Joyce, " "	1 00

JUNE 1.

TREE PÆONIES. — Six named varieties, Marshall P. Wilder,	5 00
CUT FLOWERS. — Display, W. K. Wood,	6 00
Second, Mrs. E. M. Gill,	5 00
TABLE DESIGN. — Mrs. S. Joyce,	5 00
BOUQUETS. — Pair of Parlor, James Nugent,	4 00
HARDY FLOWERING SHRUBS. — Twelve named varieties, James Nugent,	4 00
Display of Cut Blooms, J. S. Richards,	3 00
Second, F. Parkman,	2 00
Third, Miss S. W. Story,	1 00
NATIVE PLANTS. — Display of named species and varieties, Mrs. C. N. S. Horner,	4 00
Second, George E. Davenport,	3 00

Hunnewell Premiums.

HARDY RHODODENDRONS. — Twelve trusses of blooms, named varieties, Francis B. Hayes,	8 00
Single truss, Francis B. Hayes, for Mrs. Shuttleworth,	4 00
HARDY AZALEAS. — Twenty-four named varieties, Hovey & Co.,	12 00
Six named varieties, B. G. Smith,	4 00
Cluster of trusses, Hovey & Co., for Superbissima,	2 00

Gratuities: —

H. H. Hunnewell, display of Rhododendrons,	5 00
B. G. Smith, Rhododendrons,	1 00
M. H. Merriam, Rhododendrons and Azaleas,	2 00
H. H. Hunnewell, collection of Azaleas,	5 00
" " new Clematis and *Andromeda Catesbæi*,	2 00
Joseph Tailby, *Cattleya Mossiæ*,	2 00
J. Cartwright, *Cattleya crassifolia* and *Odontoglossum Alexandræ*,	4 00
Joseph Tailby, Hydrangea Thomas Hogg,	1 00
Joseph H. Woodford, fine Hardy Clematis,	5 00

F. Parkman, Seedling Clematis,	$1 00
" " collection of Iris,	1 00
John L. DeWolf, very fine Pansies,	2 00
B. G. Smith, Pansies,	1 00
James Comley, Seedling Petunias,	2 00
J. B. Moore, Iris and Cut Flowers,	3 00
James Cruickshanks, Hardy Shrubs,	1 00
Francis B. Hayes, Rhododendrons,	2 00
Miss A. C. Kenrick, Hardy Shrubs,	2 00
D. R. Beckford, Jr., Basket of Flowers,	1 00
Miss A. C. Wheeler, Dish of Flowers,	1 00
George Craft, Cut Flowers,	3 00
Mrs. C. N. S. Horner, Native Plants,	1 00
E. H. Hitchings, " "	2 00
F. W. Morandi, " "	3 00
E. W. Mitchell, " "	2 00

JUNE 8.

Gratuities: —

E. Sheppard, Rhododendrons and Azaleas,	2 00
Joseph Tailby, *Oncidium flexuosum*,	2 00
E. Sheppard, Double Ivy Leaved Pelargonium, King Albert,	2 00
Joseph H. Woodford, Hardy Clematis,	2 00
F. Parkman, Hardy Clematis and Seedling Perennial Poppy,	2 00
Mrs. L. P. Weston, Cut Flowers,	2 00
Mrs. E. M. Gill, " "	1 00
Mrs. S. Joyce, " "	1 00
Mrs. A. D. Wood, " "	2 00
George Craft, " "	3 00
G. E. Davenport, *Cypripedium spectabile* and *Hudsonia tomentosa*,	1 00
E. H. Hitchings, rare Native Flowers,	1 00
Miss K. A. Hill, " " "	1 00

JUNE 15.

Gratuities: —

Mrs. A. D. Wood, Hybrid Perpetual Roses,	1 00
J. B. Moore, " " "	1 00
Miss A. C. Kenrick, Cut Flowers,	1 00
Mrs. S. Joyce, " "	2 00
Mrs. E. M. Gill, " "	1 00
Mrs. C. N. S. Horner, Native Plants,	2 00

ROSE EXHIBITION.

June 19.

Hardy Perpetual Roses. — Six new varieties sent out since 1875, William Gray, Jr.,	$10 00
Twenty-four distinct named varieties, W. Gray, Jr.,	20 00
Twelve distinct named varieties, John C. Chaffin,	10 00
Second, John B. Moore,	8 00
Third, W. Gray, Jr.,	6 00
Six distinct named varieties, M. D. Spaulding,	6 00
Second, John B. Moore,	5 00
Third, J. S. Richards,	4 00
Three named varieties, John B. Moore,	4 00
Second, J. S. Richards,	3 00
Third, M. D. Spaulding,	2 00
Moss Roses. — Twelve named varieties, three clusters each, John B. Moore,	8 00
Tea Roses. — Twelve Maréchal Niel, M. D. Spaulding,	5 00
Twelve of any other variety, James Nugent, for Souvenir de Malmaison,	5 00
General Display. — J. S. Richards,	10 00
Second, E. W. Wood,	8 00
Third, John B. Moore,	5 00
Stove and Greenhouse Flowering Plants. — Six distinct varieties in bloom, to Hovey & Co.,	25 00
Specimen Plant. — Of a kind for which no special prize is offered, regard being had to new and rare varieties, Hovey & Co., for *Dracæna Hendersoni*,	8 00
Herbaceous Pæonies. — Ten named varieties, Hovey & Co.,	5 00
Second, A. McLaren,	4 00
Sweet Williams. — Thirty trusses, not less than six distinct varieties, E. Sheppard,	3 00
Second, James Nugent,	2 00
Third, A. McLaren,	1 00
Summer Herbaceous Plants. — Display of named species and varieties, James Nugent,	5 00
Second, Miss Sarah W. Story,	4 00
Cut Flowers. — Display, W. K. Wood,	5 00
Second, Miss E. M. Gill,	4 00
Third, James O'Brien,	3 00
Bouquets. — Pair of Parlor, James O'Brien,	4 00
Second, James Nugent,	3 00
Pair of Hand Bouquets, the second prize to James O'Brien,	3 00

Gratuities:—

Warren Heustis, Hybrid Perpetual Roses,	$2 00
F. Parkman, " " "	1 00
John C. Chaffin, " " "	1 00
J. S. Richards, " " "	1 00
James O'Brien, " " "	1 00
F. F. Raymond, Moss Roses,	3 00
M. D. Spaulding, Tea "	1 00
James Bard, General Jacqueminot Roses,	2 00
W. H. Spooner, collection of Roses,	5 00
C. H. Hovey & Co., Basket of Roses,	2 00
D. R. Beckford, Jr., " " "	1 00
E. L. Beard, *Odontoglossum*,	2 00
Joseph Tailby, *Cattleya Mossiæ*,	2 00
F. L. Ames, collection of fine Orchids,	15 00
W. C. Strong, Foliage of fine hardy Trees and Shrubs,	3 00
Herbert Gleason, Herbaceous Pæonies,	1 00
B. G. Smith, *Kalmia latifolia*,	1 00
Francis B. Hayes, *Hydrangea Otaksa* (true), and other Flowers,	2 00
Curtis, Cobb & Washburn, Japan Maples, *Retinispora*, and *Biota*,	3 00
Mrs. G. A. Estabrook, Pansies,	2 00
Mrs. S. Joyce, Herbaceous Plants,	1 00
John B. Moore, Display of Flowers,	1 00
James Comley, " " "	1 00
E. Sheppard, Cut Flowers,	3 00
Mrs. L. P. Weston, " "	2 00
George Craft, " "	3 00
Miss A. C. Kenrick, " "	1 00
James Nugent, " "	1 00
Mrs. S. Joyce, Basket of Flowers,	3 00
E. H. Hitchings. Rare Native Plants,	2 00
Mrs. C. N. S. Horner, " " "	2 00
George E. Davenport, " " "	1 00
Miss K. A. Hill, Native Flowers,	1 00
M. W. Clark, *Myosotis palustris*,	1 00

JUNE 22.

Gratuities:—

J. B. Moore, Hybrid Perpetual Roses,	3 00
Warren Heustis, " " "	1 00
M. H. Merriam, " " "	1 00
B. G. Smith, " " "	1 00
Mrs. S. Joyce, Cut Flowers,	1 00

STRAWBERRY SHOW.

JUNE 26.

DELPHINIUMS.—Six named varieties, A. McLaren,	$4 00
Second, J. B. Moore,	3 00
CUT FLOWERS.—Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
Third, George Craft,	3 00
BASKET OF FLOWERS.—C. H. Hovey & Co.,	3 00
Gratuities:—	
William Gray, Jr., very fine Hybrid Perpetual Roses,	5 00
John B. Moore, " " " "	4 00
J. S. Richards, " " " "	3 00
B. G. Smith, " " " "	1 00
Mrs. A. D. Wood, Basket of Roses,	2 00
Warren Heustis, Roses,	1 00
M. H. Merriam, Hybrid Perpetual Roses, and Display of Flowers,	3 00
J. B. Moore, Roses and Sweet Williams,	2 00
James Nugent, " " "	1 00
W. H. Spooner, Seedling Delphiniums,	1 00
Parker Barnes, fine " "	1 00
Joseph Tailby, *Lilium auratum* and *Hydrangea*,	2 00
Harry L. Rand, Sweet Williams,	2 00
James Comley, Cut Flowers and Fuchsias,	3 00
Mrs. L. P. Weston, Cut Flowers,	2 00
J. C. Hovey, " "	1 00
Miss E. M. Harris, " "	1 00
Mrs. S. Joyce, Basket of Flowers, and Display,	3 00
D. R. Beckford, Jr., Basket of Flowers,	1 00
Miss E. M. Harris, Table Design,	3 00
E. H. Hitchings, Native Flowers,	1 00
" " Rare Native Ferns,	1 00
D. R. Beckford, Jr., Native Flowers,	1 00

JUNE 29.

Gratuities:—	
B. G. Smith, Hybrid Perpetual Roses,	1 00
Mrs. S. Joyce, Cut Flowers,	1 00

JULY 6.

CARNATIONS AND PICOTEES.—Cut Blooms, twenty-four bottles, the second prize, to James Nugent,	4 00
CUT FLOWERS.—Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
TABLE DESIGN.—Mrs. S. Joyce,	3 00
Second, C. H. Hovey & Co.,	2 00

Gratuities :—

E. L. Beard, Orchids,	$3 00
J. B. Moore, fine Gloxinias,	2 00
A. P. Calder, *Nymphæa odorata*, var. *rosea*,	1 00
James Nugent, Display,	2 00
J. B. Moore, "	2 00
Mrs. L. P. Weston, Cut Flowers,	1 00
Miss S. W. Story, " "	1 00
Mrs. E. M. Gill, Basket of Flowers,	1 00
D. R. Beckford, Jr., Native Flowers,	1 00

JULY 13.

CUT FLOWERS.—Display, W. K. Wood,	5 00
Second, James O'Brien,	4 00
Third, Mrs. E. M. Gill,	3 00
HAND BOUQUETS.—Pair, W. J. Vass,	3 00
Second, James Nugent,	2 00
TABLE DESIGN.—Mrs. S. Joyce,	3 00
Second, C. H. Hovey & Co.,	2 00

Gratuities :—

E. L. Beard, *Torenia Fournieri*, and *Oncidium hastatum*,	2 00
Joseph Tailby, *Brassia verrucosa*,	2 00
James Cartwright, *Oncidium altissimum*,	1 00
J. B. Moore, fine Gloxinias,	2 00
J. S. Richards, Carnations,	1 00
" " *Lilium longiflorum*,	2 00
Stiles Frost, " "	1 00
Hovey & Co., Basket of Allamandas,	2 00
J. B. Moore, Hollyhocks and Roses,	2 00
J. S. Richards, "	1 00
A. McLaren, " and Display,	1 00
Francis B. Hayes, Display of Flowers,	2 00
James Nugent, Pinks and Petunias,	1 00
Miss S. W. Story, Basket of Flowers,	1 00
Mrs. A. D. Wood, " "	1 00
W. J. Vass, choice Cut "	1 00
George Craft, " "	2 00
HOLLYHOCKS. — Twelve blooms, of twelve distinct colors, J. B. Moore,	6 00
Second, E. Sheppard,	4 00
Six blooms, of six distinct colors, James Nugent,	5 00
Second, J. S. Richards,	3 00
Three blooms, of three distinct colors, J. S. Richards,	2 00
ORCHIDS. — Three varieties, in bloom, F. L. Ames,	6 00

Cut Flowers. — Display, W. K. Wood,	$5 00
Second, James O'Brien,	4 00
Third, Mrs. E. M. Gill,	3 00
Basket of Flowers. — The second prize to Mrs. S. Joyce,	2 00
Gratuities: —	
James Comley, *Cymbidium aloifolium*,	3 00
James Cartwright, *Cattleya Loddigesii*,	1 00
J. W. Manning, *Yucca filamentosa*,	2 00
J. B. Moore, Hollyhocks and Phlox,	2 00
Miss A. C. Wheeler, Hollyhocks and other Flowers,	1 00
J. S. Richards, Hollyhocks and Roses,	2 00
E. Sheppard, "	1 00
H. Grundel, "	1 00
James Nugent, Hand Bouquets,	1 00
Emma H. Gage, Basket of Flowers,	1 00
Mrs. E. M. Gill, " "	1 00
Miss S. W. Story, Table Design and Cut Flowers,	3 00
W. J. Vass, fine Cut Flowers,	3 00
George Craft, " "	2 00
James Nugent, " "	1 00
James Comley, Native Flowers,	1 00
E. W. Mitchell, collection of Fungi,	1 00

July 27.

Cut Flowers. — Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
Third, James O'Brien,	3 00
Fifty named varieties of Greenhouse Flowers, the third prize to Miss S. W. Story,	3 00
Basket of Flowers. — C. H. Hovey & Co.,	3 00
Second, Mrs. S. Joyce,	2 00
Gratuities: —	
Joseph Tailby, *Lilium auratum*,	1 00
E. Sheppard, Hollyhocks and Verbenas,	2 00
Herbert Gleason, Gladioli and Tritomas,	1 00
J. S. Richards, Gladioli and Dahlias,	2 00
F. Parkman, Seedling Phlox,	1 00
James Nugent, Hand Bouquets and Tritomas,	1 00
Mrs. E. M. Gill, Basket of Allamandas,	1 00
J. B. Moore, fine Cut Flowers,	2 00
Mrs. A. D. Wood, Basket of Flowers,	1 00
Miss Sarah W. Story, " "	1 00
F. B. Hayes, Display of Flowers,	2 00
Mrs. H. D. Wilmarth, *Sabbatia chloroides* (white and pink),	1 00
Mrs. C. N. S. Horner, named Native Flowers,	3 00
D. R. Beckford, Jr., " "	2 00
Mrs. E. M. Gill, " "	1 00

AUGUST 8.

STOCKS. — Six varieties, one cut plant of each, the second prize to J. S. Richards,	$2 00
BALSAMS. — Twelve spikes, eight varieties, the second prize to J. B. Moore,	2 00
Third, Mrs. S. Joyce,	1 00
HAND BOUQUETS. — Pair, James O'Brien,	3 00
Second, W. J. Vass,	2 00
CUT FLOWERS. — Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
Third, James O'Brien,	3 00
Fifty named varieties of Annuals and Herbaceous Perennials, J. B. Moore,	5 00
Second, Mrs. S. Joyce,	4 00
TABLE DESIGN. — Mrs. S. Joyce,	3 00
Second, C. H. Hovey & Co.,	2 00
Gratuities: —	
J. S. Richards, Gladioli,	5 00
James Cartwright, "	1 00
M. H. Merriam, " and White Balsams,	2 00
E. Sheppard, *Lilium auratum*,	1 00
James Comley, Pinks and Sweet Peas,	1 00
Warren Heustis, Roses and Lilies,	1 00
Mrs. E. M. Gill, Table Design,	1 00
Miss S. W. Story, " "	1 00
W. J. Vass, Display of Flowers,	1 00
George Craft, " "	1 00
Mrs. C. N. S. Horner, Native Flowers,	3 00
E. H. Hitchings, " "	1 00
G. E. Davenport, " Plants,	1 00

AUGUST 10.

PERENNIAL PHLOX. — Ten distinct named varieties, J. B. Moore,	4 00
Third prize, A. McLaren,	2 00
PETUNIAS. — Fifty bottles, not over three spikes in a bottle, the second prize to Mrs. William Latham,	3 00
CUT FLOWERS. — Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
Third, W. J. Vass,	3 00
BASKET OF FLOWERS. — C. H. Hovey & Co.,	3 00
Second, Mrs. S. Joyce,	2 00
Gratuities: —	
J. S. Richards, Gladioli,	3 00
M. H. Merriam, "	2 00
Herbert Gleason, "	1 00

Warren Heustis, Roses and Lilies,	$1 00
Miss S. W. Story, Table Design,	1 00
E. H. Hitchings, *Habenaria ciliaris*,	1 00

AUGUST 17.

GLADIOLI. — Twenty named varieties, in spikes, A. McLaren,	8 00
Second, George Craft,	6 00
Third, J. S. Richards,	4 00
Ten named varieties, in spikes, J. S. Richards,	4 00
Second, M. H. Merriam,	3 00
Third, A. McLaren,	2 00
Display of named or unnamed varieties, J. S. Richards,	8 00
Second, M. H. Merriam,	6 00
Third, Herbert Gleason,	4 00
CUT FLOWERS. — Display, W. K. Wood,	5 00
Second, J. B. Moore,	4 00
Third, Mrs. E. M. Gill,	3 00
Fifty named varieties of Annuals and Herbaceous Perennials, J. B. Moore,	5 00
Second, Mrs. S. Joyce,	4 00
Third, W. K. Wood,	3 00
TABLE DESIGN. — C. H. Hovey & Co.,	3 00
Second, Mrs. S. Joyce,	2 00

Gratuities:

E. L. Beard, fine Orchids,	2 00
Miss S. W. Story, *Lilium lancifolium*,	1 00
Mrs. E. M. Gill, Allamandas and Lilies,	1 00
C. H. Hovey & Co., Basket of Allamandas,	1 00
Joseph Tailby, Pancratiums and seedling Carnations,	1 00
Warren Heustis, Roses and Lilies,	1 00
Miss E. M. Harris, Table Design of Native Ferns,	1 00
George Craft, Cut Flowers,	1 00
James Comley, Display of Flowers,	2 00
F. B. Hayes, " "	1 00
B. G. Smith, " "	1 00
James Nugent, " "	1 00
E. W. Mitchell, collection of Fungi,	1 00
E. H. Hitchings, Native Plants,	2 00

AUGUST 24.

ASTERS. — Thirty flowers, not less than ten varieties, E. Sheppard,	5 00
Second, J. B. Moore,	4 00
Third, J. A. Black,	3 00
Fifteen flowers, not less than six varieties, Hovey & Co.,	3 00
Second, George Hill,	2 00
Third, James Nugent,	1 00

Cut Flowers. — Display, W. K. Wood,	$5 00
Second, Mrs. E. M. Gill,	4 00
Third, James O'Brien,	3 00
Basket of Flowers. — C. H. Hovey & Co.,	3 00
Second, Mrs. S. Joyce,	2 00
Gratuities: —	
J. S. Richards, collection of Gladioli,	3 00
" " choice Gladioli,	1 00
J. B. Moore, Caladiums, in pots, and Cut Flowers,	2 00
W. H. Spooner, Nasturtiums and Lilies,	2 00
E. Sheppard, Lilies and Asters,	1 00
Mrs. S. Joyce, Lilies,	1 00
S. G. Stone, Dahlias,	1 00
R. Petremant, *Scilla maritima*,	1 00
Miss S. W. Story, Dish of Flowers,	1 00
Miss A. C. Wheeler, Basket of Flowers,	1 00
C. H. Hovey & Co., " "	1 00
Miss E. M. Harris, Moss Covered Basket,	1 00
Mrs. C. B. Chase, Display of Flowers,	1 00
B. G. Smith, " "	1 00
James Nugent, " "	1 00
E. H. Hitchings, rare Native Plants,	1 00
Miss S. Carter, 2d, " " "	1 00
Joseph Comley, collection of Fungi,	1 00

August 31.

Lilies.—Display of *Lilium lancifolium*, cut flowers, Mrs. E. M. Gill,	3 00
Second, W. H. Spooner,	2 00
Verbenas.—Fifty bottles, E. Sheppard,	3 00
Second, J. B. Moore,	2 00
Third, A. McLaren,	1 00
Cut Flowers. — Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
Native Plants. — Display of named species and varieties, Mrs. C. N. S. Horner,	4 00
Second, D. R. Beckford, Jr.,	3 00
Third, E. W. Mitchell,	2 00
Gratuities: —	
George Craft, collection of Gladioli,	3 00
J. S. Richards, " "	3 00
James Cartwright, collection of fine Gladioli,	2 00
S. G. Stone, Dahlias,	1 00
Macey Randall, fine Dahlias,	2 00
B. G. Smith, *Lilium lancifolium*,	1 00
Mrs. S. Joyce, Lilies and Basket of Flowers,	2 00

J. B. Moore, Clematis,	$1 00
Norton Brothers, Asters, in pots,	2 00
Miss S. W. Story, Table Design,	1 00
Miss E. M. Harris, Design,	1 00
C. H. Hovey & Co., Basket of Flowers,	1 00
Miss A. C. Wheeler, Dish of Flowers,	1 00
Mrs. A. D. Wood, " "	1 00
F. B. Hayes, Display of Flowers,	2 00
James Nugent, " "	1 00
George E. Davenport, rare Native Plants,	1 00

SEPTEMBER 7.

DOUBLE ZINNIAS. — Twenty flowers, six varieties, J. B. Moore,	4 00
Second, Herman Grundel,	3 00
Third, George Craft,	2 00
Ten flowers, four varieties, J. L. Childs,	3 00
Second, Mrs. William Latham,	2 00
Third, James Nugent,	1 00
CUT FLOWERS. — Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
BASKET OF FLOWERS. — Mrs. S. Joyce,	3 00
Second, C. H. Hovey & Co.,	2 00
Gratuities: —	
George Craft, fine Gladioli,	3 00
James Cartwright, " "	2 00
Hovey & Co., *Coleus multicolor*,	1 00
S. G. Stone, fine Dahlias,	1 00
James Nugent, Hand Bouquets,	1 00
Mrs. C. B. Chase, Basket of Flowers,	1 00
Miss A. C. Wheeler, " "	1 00
Miss S. W. Story, Table Design and Flowers,	2 00
James Nugent, Display of Flowers,	1 00
J. L. Childs, " "	1 00
J. B. Moore, " "	1 00
B. G. Smith, " "	1 00

ANNUAL EXHIBITION.

SEPTEMBER 17, 18, 19, and 20.

GREENHOUSE PLANTS. — Twelve greenhouse and stove plants of different varieties, H. H. Hunnewell,	$30 00
Second, S. R. Payson,	25 00
SPECIMEN PLANT. — Not variegated, of a kind for which no special prize is offered, William Gray, Jr.,	6 00
Second, Hovey & Co.,	4 00

SPECIMEN FLOWERING PLANT. — Hovey & Co.,	$6 00
Second, Hovey & Co.,	4 00
VARIEGATED LEAVED PLANTS. — Six varieties, not offered in the collection of greenhouse plants, H. H. Hunnewell,	15 00
Second, William Gray, Jr.,	10 00
Single specimen, not offered in any collection, Hovey & Co.,	6 00
Second, W. J. Vass,	4 00
CALADIUMS. — Six varieties, William Gray, Jr.,	6 00
Second, E. Sheppard,	5 00
FERNS. — Six named varieties, J. Warren Merrill,	8 00
Second, Hovey & Co.,	6 00
Three new varieties, J. Warren Merrill,	5 00
Second, William Gray, Jr.,	4 00
ADIANTUMS. — Six varieties, S. R. Payson,	8 00
Second, William Gray, Jr.,	6 00
LYCOPODS. — Six named varieties, the second prize to William Gray, Jr.,	3 00
DRACÆNAS. — Six named varieties, H. H. Hunnewell,	10 00
Second, Hovey & Co.,	6 00
PALMS. — Single specimen, S. R. Payson,	6 00
Second, Hovey & Co.,	4 00
PITCHER PLANTS. — Three, the second prize to William Gray, Jr.,	6 00
AGAVES. — Six distinct varieties, Hovey & Co.,	8 00
NEW POT PLANT. — Never before shown at any exhibition of the Society, S. R. Payson, the Society's Silver Medal.	
RUSTIC STAND. — Not less than three feet in height, planted with choice plants, W. J. Vass,	5 00
GLADIOLI. — 200 bottles, best kept during the exhibition, of named or unnamed varieties, George Craft,	10 00
Second, J. S. Richards,	8 00
DAHLIAS. — Twelve named varieties, H. Grundel,	6 00
Second, S. G. Stone,	5 00
Third, Hovey & Co.,	4 00
Six named varieties, S. G. Stone,	4 00
Second, S. G. Stone,	3 00
Third, James Nugent,	2 00
Single flower, S. G. Stone,	2 00
Second, Macey Randall,	1 00
LILIPUTIAN DAHLIAS. — 50 bottles, Macey Randall,	4 00
Second, J. F. Marble,	3 00
Third, S. G. Stone,	2 00
PARLOR BOUQUETS — Pair, on Wednesday, H. Grundel,	4 00
Pair, on Thursday, H. Grundel,	4 00
Second, W. J. Vass,	3 00
HAND BOUQUETS. — Pair, on Wednesday, Mrs. S. Joyce,	4 00
Second, H. Grundel,	3 00
Pair, on Thursday, H. Grundel,	4 00
Second, Mrs. S. Joyce,	3 00

CUT FLOWERS. — 150 bottles, best kept during the exhibition, W. K. Wood,	$18 00
Second, Mrs. E. M. Gill,	16 00
Third, James Nugent,	14 00
BASKET OF FLOWERS. — Best arranged and best kept through the exhibition, Mrs. S. Joyce,	6 00
Second, Miss S. W. Story,	5 00
TABLE DESIGN. — Best kept through the exhibition, without fruit, not over four feet high, Mrs. A. D. Wood,	8 00
Second, Mrs. E. M. Gill,	5 00

Hunnewell Premiums.

EVERGREEN TREES AND SHRUBS. — The second prize for display to J. W. Manning,	6 00

Gratuities: —

W. J. Vass, collection of Plants,	12 00
Norton Bros., " "	8 00
Hovey & Co., " "	6 00
Daniel Duffley, *Anemone Japonica*,	2 00
" " Celosias,	2 00
W. C. Strong & Co., collection of Variegated Leaved Plants,	3 00
E. Sheppard, collection of Roses,	1 00
James Comley, fine Roses,	1 00
E. Sheppard, collection of Coleus,	4 00
Henry Ross, " "	5 00
Hovey & Co., *Lilium Neilgherrense*,	1 00
J. Warren Merrill, New and Rare Ferns,	5 00
Miss S. W. Story, *Erianthus Ravennæ*,	1 00
" " " Display of Dianthus,	1 00
J. B. Moore, *Maranta Makoyana*, and *Caladium argyrites*,	3 00
S. R. Payson, Caladiums,	4 00
F. B. Hayes, for *Magnolia tripetala*, in fruit, and *Hibiscus moscheutos*,	2 00
W. J. Vass, Display of *Passiflora princeps*,	3 00
James Cartwright, Orchids,	4 00
" " Gladioli,	3 00
E. Sheppard, "	2 00
W. H. Spooner, Nasturtiums and Tritomas,	2 00
H. Grundel, fine White Balsams,	1 00
Hovey & Co., White Dahlias,	1 00
" " *Dahlia viridiflora*,	1 00
S. G. Stone, collection of Dahlias,	2 00
Macey Randall, " "	1 00
George Craft, Display of Cockscombs,	1 00
R. Manning, Cornelian Cherry,	1 00
W. C. Strong & Co., Display of Flowers,	3 00
George Craft, " "	3 00
J. S. Richards, " "	2 00

F. B. Hayes, two Vases of Flowers, ... $5 00
J. F. M. Farquhar, Design for a Garden, ... 15 00
Mrs. W. H. Bates, Table Design, ... 3 00
Miss E. M. Harris, Design of Native Flowers, ... 5 00
E. H. Hitchings, varieties of *Botrychium ternatum*, ... 2 00
Mrs. C. N. S. Horner, Native Flowers, ... 3 00
D. R. Beckford, Jr., " " 2 00

OCTOBER 5.

TABLE DESIGN. — Mrs. S. Joyce, ... 3 00
HAND BOUQUETS. — Pair, James Nugent, ... 3 00
VASE OF FLOWERS. — Best arranged, Mrs. E. M. Gill, ... 5 00

Gratuities: —

W. C. Strong, Autumn Foliage of New Cut Leaved Maples, . . 1 00
William Beet, Large Sunflower, ... 1 00
Miss S. W. Story, *Eulalia Japonica*, ... 2 00
W. H. Spooner, *Tritoma Uvaria*, ... 1 00
S. G. Stone, collection of Dahlias, ... 4 00
Macey Randall, " " 2 00
Hovey & Co., " " 1 00
E. Sheppard, " " 1 00
Miss S. W. Story, Basket of Flowers, ... 2 00
Miss A. C. Wheeler, " " 1 00
Miss E. M. Harris, Table Design, ... 2 00
W. K. Wood, Display of Flowers, ... 3 00
James Nugent " " 2 00
Mrs. L. P. Weston, " " 2 00
Mrs. E. M. Gill, Display of Flowers, ... 1 00
John Parker, " " 1 00
James Comley, " " 1 00
Miss S. W. Story, " " 1 00
E. H. Hitchings, varieties of *Botrychium ternatum*, ... 2 00

CHRYSANTHEMUM SHOW.

NOVEMBER 9.

CHRYSANTHEMUMS. — Six distinct named Large Flowered varieties,
H. L. Higginson, ... 8 00
Six distinct named Pompons, F. L. Ames, ... 8 00
Second, H. L. Higginson, ... 6 00
Four named Liliputians, H. L. Higginson, ... 4 00
Specimen Plant, E. Sheppard, ... 5 00
Second, F. L. Ames, ... 4 00
Third, H. L. Higginson, ... 3 00
Twelve named Pompon varieties, cut specimens, H. L. Higginson, 3 00
Second, James Nugent, ... 2 00

General display of named or unnamed varieties, fifty bottles, E. Sheppard,	$5 00
Second, Mrs. E. M. Gill,	4 00
Third, James Nugent,	3 00
Basket of Flowers. — Mrs. S. Joyce,	3 00
Hand Bouquets. — Pair, James Nugent,	3 00
Second, W. J. Vass,	2 00

Gratuities: —

F. L. Ames, collection of very fine Orchids and other Plants,	10 00
James Cartwright, very fine *Oncidium varicosum*,	2 00
Norton Brothers, collection of Chrysanthemums,	5 00
E. Sheppard, Geraniums and Chrysanthemums,	1 00
James Nugent, Cut Roses,	2 00
J. B. Moore, Vase of Flowers,	1 00
Mrs. A. D. Wood, Cut Flowers,	2 00
James Comley, " "	1 00
Mrs. C. N. S. Horner, Native Plants,	1 00

December 14.

Gratuity: —

J. Cartwright, Orchids,	4 00

The Committee have awarded Medals and Certificates of Merit as follows:—

Silver Medals.

January 19. H. H. Hunnewell, for *Cœlogyne cristata.*

March 2. H. H. Hunnewell, for *Cypripidium Dayanum.*

March 9. Marshall P. Wilder, for *Azalea Exquisita.*

March 23. F. L. Ames, for *Dendrobium Falconeri.*

June 1. H. H. Hunnewell, for *Azalea mollis*, and new and choice named Rhododendrons.

June 8. Francis B. Hayes, for a very choice collection of Rhododendrons and other Shrubs.

Strawberry Show, June 26. F. L. Ames, for *Lælia majalis.*

June 29. Francis Parkman, for new Seedling Japan Iris.

July 13. Francis Parkman, for new Seedling Phlox, Mrs. Derby.

July 20. F. L. Ames, for *Cattleya Dowiana.*

August 24. T. Putnam Symonds, for *Lilium auratum.*

Annual Exhibition, September 17–20. F. L. Harris, for Seedling *Dracæna Harrisii* (No. 20).

Chrysanthemum Show, November 9. F. L. Ames, for a very fine plant of *Nepenthes Chelsoni.*

Bronze Medals.

Rose Show, June 19. John C. Hovey, for new Double Pyrethrums.

John R. Brewer, for *Andromeda speciosa.*

Strawberry Show, June 26. John C. Hovey, for new Seedling Herbaceous Pæonies.

August 3. Miss S. W. Story, for *Lilium Leichtlini*.

August 17. W. H. Spooner, for new Gladiolus, Diamond.

Annual Exhibition, September 17–20. F. B. Hayes, for *Pinus Massoniana variegata*.

First Class Certificates of Merit.

March 2. F. L. Ames, for *Dendrobium Ainsworthii*.

Annual Exhibition, September 17–20. F. B. Hayes, for *Castanea aurea variegata*.

REPORT

OF THE

COMMITTEE ON FRUITS,

FOR THE YEAR 1878.

By JOHN B. MOORE, CHAIRMAN.

Another season has passed, and the time has arrived when this Society requires a report of the doings of their Fruit Committee.

Perhaps it would be proper first to give the general conditions of the weather and season, so far as they have influenced the growth of plants and their products.

After passing through the winter season of 1877 and 1878, which, taken as a whole, was rather mild and pleasant, we had an early spring, March being remarkably mild for that usually boisterous month, and the frost leaving the ground quite early. April was mild, dry, and warm for the season, and these favorable conditions of both the weather and the soil were early taken advantage of, and all garden operations were in a very forward state at the close of the month.

The month of May was cool, with occasional sharp and, in some instances, destructive frosts. The first half of June was also cool, with frosts in some localities; up to this time, and including the whole of the spring months, there were seasonable rains. The last half of June and the first half of July were quite hot, and the surface of the ground became quite dry; still the soil was not dried so deep as to seriously check vegetation, which advanced very rapidly.

From the middle of July until September the weather was cooler, with much rain and cloudy weather, the rain falling in very heavy showers, and being in some localities accompanied with hail, which caused considerable damage to fruits, plants, and grass, beating down crops, and washing the soil from the hill-sides. In the months of September and October we had a succession of days of fine weather, and were exempted from severe frosts until nearly the first of November, while the rain was sufficient for all practical purposes. The month of November was milder than usual for the season of the year, enabling every careful person to complete his garden operations in season for the coming winter. In the last half of the month, there was a very large rainfall, in one instance six and one-half inches falling in five days. The ground is saturated with water, and, as some think, is in just the right condition to freeze up for the coming winter.

It has been found by careful observation that almost every time there is what is called an early start in the spring, arising from a warm March and April, it is followed by a cold May, and perhaps June, killing plants outright by frost, and stunting and ruining others by cold days and nights. Melons, beans, and other plants have been so injured, and the early blossoms of strawberries, and others of the small fruits, have been killed by frost the present year. These early springs, which stimulate the cultivator to early planting, and in which his fond hopes are suddenly brought to grief by frosts and cold, are not desirable. Almost the only redeeming point about such a season that suggests itself to a practical person is, that one can forward his work at this busy time of the year.

The killing of strawberry blossoms, and of the small green berries by frost, which has happened the present year, would not be of so much importance (as strawberries, particularly some varieties, set more fruit than they can ripen) were it not that when the frost destroys a strawberry blossom, or a green berry, it will certainly be that one which would make the first, best, and largest fruit on the plant. In large fields this would cause a heavy loss in the value of the product.

The conditions of the weather which have been described are not common when the season opens later. Assuming our propositions concerning them to be true, cultivators can, by judicious planting, avoid some of the losses consequent upon them. They should not

plant such tender flowers, fruits, or vegetables as would be injured by frosts or cold nights, until, in their judgment, there is a reasonable prospect of settled warm weather. They should not be led astray by one or two warm days. It has been said that one swallow does not make a summer, neither does one pleasant day make a warm season.

The cool, cloudy, wet weather in August was unfavorable to the ripening of grapes, and some other crops, and unfortunately presented the conditions which favor a rapid development of mildew on the foliage of the grape, and many other plants. The rest of the season was favorable for almost all purposes. The most prominent, and perhaps most uncommon feature of the season, has been the fine verdure of the grass, and the healthy foliage on the trees from early spring until late in October.

Strawberries. — The first strawberries placed on exhibition were the Triomphe de Gand, forced in pots, and exhibited in April. The next were some berries grown in cold frames, and shown on the 25th of May. In the latter named class there was only a small competition on the prize day, June 1st. These premiums have been omitted in the list for 1879, and, in the judgment of the Committee on Fruits, very properly.

On the 26th of June the Society held its Annual Strawberry Show. The number of baskets was not as large as the previous year, and the specimens as a whole were not as good, owing, probably, to the fact that in many instances the first, or what would have been the largest berries, were killed by the frost. Still there were some fine baskets of fruit; the best was La Constante. This old variety comes to the front every few years. It is thought to be an extremely capricious variety, and not desirable for general cultivation.

The first prize for two new named varieties was awarded to Ex-President Marshall P. Wilder, for two seedlings of his own, named Hero and Abundant. They were both large and showy berries. Mr. Wilder also showed some other seedlings, but the Committee did not give any of them such an examination as would warrant an opinion. George S. Harwood exhibited some foreign kinds, taking the second prize for two new varieties with the President Green and Duke of Edinburgh. The two prizes for the best fifty berries were awarded to the Walden and the Belle. A few new varieties were exhibited early in the season from the State

of New York, but were not in good condition, and, therefore, the Committee decline to express any opinion as to their merits. No other new varieties of marked character have been shown.

The whole number of baskets and dishes of strawberries exhibited was sixty-five, a much less number than last year. Annexed will be found a description of Col. Wilder's seedlings, Hero, Abundant, and Dorchester; also, Prouty's Seedling:

Hero. — Very large; form varying from long conical to cockscomb; surface, polished crimson; seeds not deeply sunken; flesh, red, not very juicy or high flavored.

Abundant. — Large; conical, flattened, tolerably regular; seeds generally sunken and red; color, crimson; flesh, red, solid, juicy, and good; flowers, pistillate.

Dorchester. — Of good size, but not as large as the two preceding; conical, sometimes flattened laterally or cockscombed; seeds pretty deeply sunken and red; color, crimson, or inclining to scarlet; flesh, white, of tolerable flavor; flowers, pistillate.

Prouty's Seedling. — Medium size; generally long, irregular, conical, sometimes cockscombed; seeds not deeply sunken; when fresh, bright crimson, but becomes dingy; flesh, red, juicy, with a not very pleasant acid.

Cherries. — We have nothing particular to say about cherries; the old varieties, Black Tartarian and Coe's Transparent, have taken the principal prizes.

Raspberries. — July 13th and 20th the first prizes for this fruit were awarded, respectively, to the Saunders and the Pride of the Hudson; the latter being a new variety shown by E. P. Roe, of Cornwall, on the Hudson. It appeared to be of good size and fair quality, but not equal in either of these points to some berries shown later in the season.

Currants and Gooseberries. — The exhibition of currants was as fine as usual. There were no new varieties of marked excellence exhibited. The same remarks would apply to gooseberries.

Blackberries. — There was not a large show of blackberries this year, many of the bushes being winter killed; much the finest basket was the Dorchester, shown by James Nugent, August 3d.

Amelanchier. — On the 13th of July, Benjamin G. Smith exhibited fruit of *Amelanchier Canadensis*, var. *oblongifolia* T. and G., or Dwarf June Berry. This has been procured and tested at considerable expense by Mr. Smith, and as it is hardy and pro-

ductive it may prove to be desirable. The Committee have thought it proper to award to Mr. Smith the Society's Silver Medal for its introduction.

Apples. — This year being the even year we expected a large crop of apples, and we were not disappointed. It has become a settled fact that we do have large crops of apples every even year. Now, if any persons can change the bearing year of their orchards from the even to the odd year, they will be sure to realize much larger prices for their fruit; but the bearing of only a few trees in an orchard which has produced a large crop the previous year does not amount to much, for the apple maggot, and the larvæ of the codling moth and curculio, have escaped in such large numbers the previous year, as to be able to puncture and spoil nearly all the fruit from a few trees. There appear to be three causes affecting the conditions of our apple trees, which fully account for the large crop of fine apples. First, the very small crop of 1877 enabling the trees to perfect their fruit buds for the crop of 1878. Second, the much smaller number of insects to prey upon the young fruit, from the fact that they were starved out the previous year. Third, the favorable season, in which the abundance of rain gave moisture enough to cause the fruit to grow of large size. The apples shown during the whole season have been very large, fair, handsome, and of fine quality—perhaps never better. At the Annual Exhibition, there were four hundred and eight plates of apples on the tables, all of them of fine quality.

Pears. — The crop of pears has been much smaller this year than usual; there were apprehensions at one time that we should have only meagre shows of this fruit, but there has been a good exhibition the whole season, and in size and quality the specimens have been fully up to the average. We have found sufficient competition on prize days to cause nearly all the prizes to be awarded, and have had to pass by many fine dishes of this fruit.

At the Annual Exhibition there were shown on the tables three hundred and seventy-four dishes of pears; very large, smooth, handsome specimens.

Of the new seedlings, Clapp's No. 64 was shown in April; this is a sweet pear of only second rate quality, but its keeping so late in the season may make it a very desirable pear. Messrs. Clapp's Seedling No. 22, or Frederick Clapp, still maintains its character, and is a first rate pear. There have been a few other seedlings

from Messrs. Clapp, and from others, but not of such marked excellence, so far as we can judge from the examination we have been able to make, as to require a further opinion or description, except one raised by Stephen Osborne, of Peabody. This was presented May 25th, and is of medium size; globular acute pyriform; dull green, with much brownish russet, or sometimes entirely covered with russet; skin, thick; flesh, gritty, but sweet and juicy, and remarkably melting and buttery for so late a pear. Among the fine autumn varieties this would not be thought worthy of attention, but keeping almost to June it appeared deserving of notice.

Peaches have not been plenty, and a less number of dishes have been shown than usual, although there have been some very fine specimens on our tables. Quite a number of dishes of seedling peaches, some of them large and handsome, having a strong resemblance to the Crawford's Early and Crawford's Late, have been shown, but none of them perhaps quite as good as either of those standard varieties.

Plums. — The last two years show a marked increase in the number of dishes exhibited, and many of the specimens have been of fine quality. The trees do not appear to be so much troubled with the black wart as formerly, and there is a prospect of having a reasonable crop of this fine fruit again. We would suggest to persons, if they have an enclosure in which fowls are confined, and the ground is suitable in other respects, to plant it with plum trees. In such a place the trees will grow well, and, when they come to bear fruit, a jar or shake of the tree, at the proper time, will cause the curculio to fall to the ground, and they will quickly be destroyed by the fowls.

Grapes.—There has been a very small crop of grapes this season. For some reason grape vines did not show nearly as many or as strong trusses of buds for blooming this year as usual. This was not by any means confined to weak growing kinds, but the Concords, and other strong growing varieties, which have almost always set a great deal too much fruit, were as much affected as any. Pruning had nothing to do with it, for whether the vines were pruned closely or allowed to ramble it was all the same; the trusses of buds were poor and weak in the beginning, and did not appear to have strength enough to set well. This was followed in August by mildew, which injured the foliage of many varieties so

much that the poor show of fruit in June was almost destroyed, and hardly vitality enough remained in the leaves to ripen the fruit, although they were not killed by the frost until about the first of November. Some varieties have been and are more subject to mildew than other varieties; the leaves of all hybrids have been more injured than the native kinds. Why should it not be so? Is it not in accordance with the laws of reproduction that the defects of the parent will be transmitted to the progeny?

The hybrids are crosses between the foreign and native species; the foreign has two serious faults in our climate; one is a tenderness of the vine itself; the other a tendency to mildew on the foliage, and also on the fruit. When a vine is so affected as to drop nearly all its leaves in August, there is not only a loss of the crop of fruit for that year, but the vine receives such a shock that it will hardly be strong enough to withstand the rigor of a Massachusetts winter—much more to produce a crop the succeeding year. The laws of breeding plants, as well as animals, show that like produces like in the vegetable as well as in the animal kingdom,—modified somewhat by outside influences in both.

No new varieties, not before exhibited, have been shown. James H. Ricketts, of Newburg, N. Y., presented some of his new seedlings of the same varieties that have been heretofore exhibited. They were not quite as good as he has shown here before, but this was very likely owing to the unfavorable season.

There was no competition for bunches of foreign grapes, weighing not less than five pounds. For the other prizes there was a fair display, but nothing of unusual merit.

The Committee recommend to the Society that all small fruits, exhibited for prizes or gratuities, shall be shown in baskets not exceeding an inch and three-quarters in depth, and corresponding in form to a model to be adopted by the Society. The objects which it is believed will be attained by this rule are the following: First, exactness and uniformity in quantity, as required by the Schedule. Second, the Committee would be able to see nearly all the fruit in the basket, and could judge more fairly and exactly. Third, a more uniform appearance of the tables.

The appropriation for the year 1878 was $1,425; the amount awarded in prizes and gratuities was $1,225; leaving a balance of $200.

The Committee have also awarded one Silver Medal, and one First Class Certificate of Merit.

Annexed will be found a list of the prizes and gratuities awarded.

All of which is respectfully submitted.

JOHN B. MOORE,
P. B. HOVEY,
E. W. WOOD,
BENJ. G. SMITH,
JACOB W. MANNING,
DANIEL T. CURTIS,
CHAS. F. CURTIS,

Fruit Committee.

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

January 5.

Gratuities: —

Warren Fenno, Josephine de Malines Pears, ... $1 00
Benjamin G. Smith, " " " " 1 00

February 2.

Winter Pears. — Any variety, Marshall P. Wilder, Beurre d'Anjou, 3 00
Second, Marshall P. Wilder, Beurre d'Aremberg, . . . 2 00
Winter Apples. — Any variety, C. E. Grant, Baldwin, . . . 3 00
Second, Benjamin P. Ware, Peck's Pleasant, ... 2 00

Gratuities: —

Marshall P. Wilder, collection of Pears, ... 2 00
C. E Grant, " " 1 00
Benjamin G. Smith, Pears, ... 1 00

February 9.

Gratuity: —

Warren Fenno, collection of Pears, ... 1 00

March 2.

Winter Pears. — Any variety, J. V. Wellington, Beurre d'Anjou, . 3 00
Second, J. V. Wellington, Winter Nelis, ... 2 00
Winter Apples. — Any variety, C. E. Grant, Baldwin, . . . 3 00

Gratuities: —

C. E. Grant, Catillac Pears, ... 1 00
A. S. McIntosh, Easter Beurre Pears, ... 1 00
C. D. Kingman, Oranges, ... 1 00

April 6.

Gratuities: —

A. S. McIntosh, Pears, ... 1 00
C. E. Grant, collection of Pears and Apples, ... 1 00
James Comley, Triomphe de Gand Strawberries, ... 2 00
F. & L. Clapp, Seedling Pear, No. 64, of fine appearance for the season, a First Class Certificate of Merit.

MAY 25.

Gratuity: —

Charles Garfield, Strawberries grown in a cold frame, . . . $1 00

JUNE 1.

FORCED GRAPES. — Two bunches of any variety, Cephas H. Brackett, Black Hamburg, ... 7 00
Second, Peter Smith, Black Hamburg, ... 4 00
STRAWBERRIES. — One quart of any variety, grown in a frame under glass, Charles Garfield, ... 5 00
Second, John B. Moore, ... 4 00

JUNE 8.

Gratuities: —

E. P. Richardson, Jenny Lind Strawberries, ... 1 00
C. D. Kingman, Monarch of the West Strawberries, . . . 1 00

JUNE 15.

Gratuities: —

Aaron D. Capen, Charles Downing Strawberries, ... 2 00
Warren Fenno. Brighton Pine " 2 00
Marshall P. Wilder, Hervey Davis " 1 00
George Hill, Col. Cheney " 2 00
G. M. Mellen, Cutter's Seedling " 1 00
William G. Prescott, " " 2 00
C. E. Grant, Cherries, ... 2 00

ROSE SHOW.

JUNE 19.

EARLY STRAWBERRIES. — Four quarts, open culture, Charles Garfield, 7 00
Second, John B. Moore, ... 5 00
Third, George Hill, ... 3 00
Two quarts, John B. Moore, ... 4 00
Second, Charles Garfield, ... 3 00
FORCED GRAPES. — Three varieties, two bunches of each, Cephas H. Brackett, ... 7 00
Two bunches, of any variety, Cephas H. Brackett, Black Hamburg, 4 00
Second, H. S. Mansfield, ... 3 00

Gratuities: —

C. E. Grant, collection of Cherries, ... 2 00
Miss E. M. Harris, Lennig's White Strawberries, ... 1 00
M. W. Chadbourne, Charles Downing " 1 00

STRAWBERRY SHOW.

June 26.

Strawberries. — Four quarts, of any variety, C. M. Atkinson, La Constante,	$10 00
Second, M. W. Chadbourne, Jucunda,	8 00
Third, Marshall P. Wilder, President Wilder,	6 00
Two new named varieties, not previously exhibited, Marshall P. Wilder,	4 00
Second, George S. Harwood,	3 00
Fifty berries, of any variety, John B. Moore, Walden,	4 00
Second, Stiles Frost, Belle,	3 00
Two quarts Caroline, E. W. Wood,	3 00
Second, John B. Moore,	2 00
Charles Downing, E. P. Richardson,	3 00
Second, John B. Moore,	2 00
Hovey's Seedling, Benjamin G. Smith,	3 00
Second, E. P. Richardson,	2 00
Jenny Lind, E. P. Richardson,	3 00
Jucunda, E. W. Wood,	3 00
Lady of the Lake, John B. Moore,	3 00
President Wilder, Horace Eaton,	3 00
Second, John B. Moore,	2 00
Seth Boyden (No. 30), Marshall P. Wilder,	3 00
Second, Horace Eaton,	2 00
Triomphe de Gand, Charles Garfield,	3 00
Cherries. — Four varieties, two quarts each, C. E. Grant,	5 00
Second, Aaron D. Capen,	4 00
Two quarts of any variety, J. B. Loomis, fine Coe's Transparent,	3 00
Second, Thomas S. Lockwood, " "	2 00
Grapes. — Two bunches of any variety, Cephas H. Brackett, Black Hamburg,	4 00
Gratuities: —	
Cephas H. Brackett, collection of Foreign Grapes,	2 00
Warren Fenno, Belle and Monarch of the West Strawberries,	2 00
E. P. Richardson, Champion Strawberries,	1 00
John B. Moore, collection of "	3 00
Hovey & Co., " "	3 00
Horace Eaton, Strawberries,	1 00

June 29.

Gratuities: —	
J. B. Loomis, Cherries,	1 00
Warren Fenno, Strawberries,	1 00
Benjamin G. Smith, "	2 00
Charles Garfield, "	1 00
E. P. Richardson, "	1 00

JULY 6.

CHERRIES. — Two quarts, Thomas S. Lockwood, Coe's Transparent, $3 00
Second, Horace Partridge, Black Tartarian, ... 1 00
STRAWBERRIES. — Two quarts of any late variety, John B. Moore, Belle, ... 3 00
Second, Marshall P. Wilder, Abundant, ... 2 00

Gratuities: —

E. P. Richardson, Kentucky Strawberries, ... 1 00
C. E. Grant, Cherries, ... 1 00
W. K. Wood, collection of Currants, ... 2 00
M. W. Chadbourne, " 1 00
E. W. Mitchell, " 1 00
Warren Fenno, Black Cap Raspberries, ... 1 00
J. C. Keating, Mulberries, ... 1 00
C. D. Kingman, Peaches, ... 1 00
Cephas H. Brackett, collection of Foreign Grapes, . . . 2 00

JULY 13.

RASPBERRIES. — Two quarts, Warren Fenno, Saunders, . . . 3 00
Second, E. P. Roe, Pride of the Hudson, ... 2 00
Third, W. Doran & Son, Franconia, ... 1 00
CURRANTS. — Four quarts of a red variety, W. K. Wood, Versaillaise, 3 00
Second, W. Doran & Son, Versaillaise, ... 2 00
Third, Benjamin G. Smith, " 1 00
Four quarts of a white variety, E. P. Roe, White Grape, . . 3 00
Second, Benjamin G. Smith, Transparent, ... 2 00

Gratuities: —

Warren Fenno, Cherries, ... 1 00
E. W. Mitchell, Currants, ... 1 00
J. S. Richards, " 1 00
Mrs. E. M. Gill, " and Raspberries, ... 1 00
Charles Garfield, " " 1 00
Cephas H. Brackett, Black Hamburg Grapes, ... 1 00
Benjamin G. Smith, for the introduction of *Amelanchier Canadensis*, var. *oblongifolia*, or Dwarf June Berry, the Society's Silver Medal.

JULY 20.

RASPBERRIES. — Not less than four varieties, one quart each, E. P. Roe (eight varieties), ... 5 00
Second, Joseph Clark, ... 3 00
Two quarts, any variety, E. P. Roe, Pride of the Hudson, . . 3 00
Second, Warren Fenno, Saunders, ... 2 00
Third, W. K. Wood, Clarke, ... 1 00

CURRANTS. — Not less than four varieties, two quarts each, Warren Fenno, ... $5 00
Second, W. Doran & Son, ... 3 00
Four quarts, any variety, W. Doran & Son, Versaillaise, . . 3 00
Second, Mrs. E. M. Gill, Versaillaise, ... 2 00
Third, C. E. Grant, ... 1 00
BLACKBERRIES. — Two quarts, E. P. Roe, Early Wilson, . . . 3 00
GOOSEBERRIES. — Two quarts, Horace Eaton, Downing, . . . 3 00
Second, B. G. Smith, Downing, ... 2 00
Third, Charles Garfield, Royal George, ... 1 00

JULY 27.

BLACKBERRIES. — Two quarts, James Nugent, Dorchester, . . 3 00
Second, B. C. Vose, Dorchester, ... 2 00
PEARS. — Doyenne d'Été, W. P. Walker, ... 3 00
Second, Asa Bullard, ... 2 00

Gratuities : —

D. F. Hayes, Delaware Grapes, grown under glass, ... 1 00
B. G. Smith, Foreign Gooseberries, two varieties, ... 2 00
Charles Garfield, collection of Gooseberries and Raspberries, . . 1 00
C. M. Atkinson, Black Currants, ... 1 00

AUGUST 3.

PEARS. — Beurre Giffard, Warren Heustis, ... 3 00
Second, Warren Fenno, ... 2 00
Third, Benjamin G. Smith, ... 1 00
APPLES. — Early Harvest, the second prize to Benjamin G. Smith, 2 00
Large Yellow Bough, G. M. Mellen, ... 3 00
Second, Lewis Slack, ... 2 00

Gratuities : —

T. Putnam Symonds, Alexander Peaches, ... 1 00
J. H. Woodford, Red Astrachan Apples, ... 1 00
Samuel Hartwell, Apples, ... 1 00
N. B. White, " 1 00
Charles Garfield, Blackberries and Raspberries, ... 1 00
James Nugent, very fine Dorchester Blackberries, ... 1 00
J. C. Weld, Chinese Pears, grown in Georgia, ... 1 00

AUGUST 10.

GOOSEBERRIES. — Two quarts of Foreign, Benjamin G. Smith, Bangup, ... 3 00
Second, Benjamin G. Smith, Wellington's Glory, ... 2 00

Apples. — Early Harvest, D. F. Hayes,	$3 00
Large Yellow Bough, Mrs. B. B. Davis,	3 00
Second, Edwin Fletcher,	2 00
Red Astrachan, E. W. Wood,	3 00
Second, John Cummings,	2 00
Williams, Warren Heustis,	3 00
Second, John Cummings,	2 00
Any other early variety, T. M. Davis, Summer Harvey,	3 00
Second, John Cummings, Tetofsky,	2 00
Pears. — Any early variety, George Frost, for Suprême de Quimper,	3 00
Second, Warren Heustis, Beurre Giffard,	2 00

Gratuities:—

Edwin Fletcher, Apples,	1 00
Samuel Hartwell, Apples,	1 00
Mrs. H. V. Draper, Peach Plums,	1 00

August 17.

Pears. — Clapp's Favorite, F. & L. Clapp,	3 00
Second, Charles L. Bird,	2 00
Third, Mrs. E. M. Gill,	1 00

Gratuities:—

C. D. Kingman, cold house Peaches,	2 00
Mrs. H. V. Draper, Washington Plums,	1 00
C. M. Atkinson, collection of Foreign Grapes,	5 00
Benjamin G. Smith, Apples,	1 00
John Cummings, "	1 00
Samuel Hartwell, "	1 00
Warren Heustis, " and Pears,	1 00
J. T. Foster, " and Peaches,	1 00
Warren Fenno, " "	1 00

August 24.

Pears. — Bartlett, Alexander Dickinson,	3 00
Second, Charles F. Curtis,	2 00
Third, T. M. Davis,	1 00
Tyson, A. S. McIntosh,	3 00
Second, Warren Fenno,	2 00
Third, Samuel McIntosh,	1 00
Plums. — Any variety, Hovey & Co., Bradshaw,	3 00
Second, Daniel Tucker, "	2 00
Third, Edwin A. Hall, Prince's Imperial Gage,	1 00
Peaches. — Any variety, Horace Partridge,	3 00
Second, J. T. Foster, Laura,	2 00

Gratuities:—

Amos Bates, Plums,	$1 00
Joseph Gardner, Washington Plums,	1 00
J. E. Hodgkins, Peaches,	1 00
Robert Manning, Dearborn's Seedling Pears,	1 00
Benjamin G. Smith, White Chasselas Grapes,	1 00
John Cummings, collection of Apples,	2 00
Samuel Hartwell, Apples,	1 00
John B. Moore, "	1 00

AUGUST 31.

APPLES. — Any variety, Samuel Hartwell, Gravenstein,	3 00
Second, John Cummings, Garden Royal,	2 00
Third, Charles Bird, Gravenstein,	1 00
PEARS. — Bartlett, T. M. Davis,	3 00
Second, C. N. Brackett,	2 00
Third, A. S. McIntosh,	1 00
Any other variety, Joseph S. Chase, Clapp's Favorite,	3 00
Second, Benjamin G. Smith, Duchesse de Berry,	2 00
Third, George T. Oakes, Clapp's Favorite,	1 00
PLUMS. — Collection of not less than four varieties, Horace Eaton,	4 00
Dish of any variety, Hovey & Co., Bradshaw,	3 00
Second, J. T. Foster, Prince's Imperial Gage,	2 00
Third, Horace Eaton, Bradshaw,	1 00
NATIVE GRAPES. — Six bunches of any early variety, John B. Moore, Moore's Early,	3 00

Gratuities:—

A. S. McIntosh, Crawford's Early Peaches,	1 00
Warren Fenno, Apples and Peaches,	1 00
E. Fred Washburn, Seedling Peaches,	1 00
J. D. Hovey, Seedling Peaches,	1 00
Horace Partridge, Peaches and Grapes,	1 00
C. H. Johnson, Seedling Peaches,	1 00
N. D. Harrington, large and very fine Crawford's Early Peaches,	2 00
John Cummings, Apples,	1 00
Samuel Hartwell "	1 00
Mrs. E. S. Joyce, Figs,	1 00
Edwin Fletcher, Apples,	1 00
J. L. D. Sullivan, White Seedling Nectarines,	1 00

SEPTEMBER 7.

APPLES. — Foundling, Leonard W. Weston,	$3 00
Second, Edwin Fletcher,	2 00
Third, Samuel Hartwell,	1 00
Gravenstein, Samuel Hartwell,	3 00
Second, M. H. Merriam,	2 00
Third, Charles Bird,	1 00
Porter, George Hill,	3 00
Second, Edwin Fletcher,	2 00
Third, John Cummings,	1 00
Any other variety, C. N. Brackett, Alexander,	3 00
Second, John Cummings, Garden Royal,	2 00
Third, Charles Stearns, Dutch Codlin,	1 00
PEARS. — Andrews, Charles F. Curtis,	3 00
Second, Horace Partridge,	2 00
Third, George Frost,	1 00
Belle Lucrative, George T. Oakes,	3 00
Second, Horace Partridge,	2 00
Third, Charles Bird,	1 00
Doyenne Boussock, E. W. Wood,	3 00
Second, C. N. Brackett,	2 00
Third, George Frost,	1 00
Any other variety, J. V. Wellington, Bartlett,	3 00
Second, Alexander Dickinson, "	2 00
Third, A. S. McIntosh, "	1 00
NATIVE GRAPES. — Six bunches, any early variety, John B. Moore, Moore's Early,	3 00
Second, J. W. Talbot, Cottage,	3 00
Third, Benjamin G. Smith, Moore's Early,	1 00
PEACHES. — Any variety, Horace Eaton, Oldmixon Freestone,	3 00
Second, Henry Souther, Crawford's Early,	2 00
Third, George T. Oakes, Foster,	1 00

Gratuities:—

Stiles Frost, Plums,	1 00
Horace Partridge, Macready's Early Grapes,	1 00
Mrs. E. S. Joyce, Brown Turkey Figs,	1 00
Caleb Bates, Peaches,	2 00
Samuel Hartwell, Apples,	1 00
Edwin Fletcher, "	1 00
J. T. Foster, Peaches and Apples,	1 00
Warren Fenno, Pears,	1 00

ANNUAL EXHIBITION.

SEPTEMBER 17, 18, 19, AND 20.

APPLES. — American Beauty, Edwin Fletcher,	$3 00
Baldwin, Samuel Hartwell,	3 00
Second, John Cummings,	2 00
Third, Edwin Fletcher,	1 00
Cogswell, C. N. Brackett,	3 00
Second, Asa Clement,	2 00
Danvers Winter Sweet, John Cummings,	3 00
Second, Warren Fenno,	2 00
Duchess of Oldenburgh, O. B. Hadwen,	3 00
Second, George Frost,	2 00
Dutch Codlin, F. & L. Clapp,	3 00
Second, A. S. McIntosh,	2 00
Fall Orange, or Holden Pippin, Asa Clement,	3 00
Second, George Winn,	2 00
Third, Edward Sumner,	1 00
Fameuse, Benjamin G. Smith,	3 00
Second, Asa Clement,	2 00
Foundling, Edwin Fletcher,	3 00
Second, Asa Clement,	2 00
Third, O. B. Hadwen,	1 00
Garden Royal, John Cummings,	3 00
Second, Edwin Fletcher,	2 00
Golden Russet, Warren Fenno,	3 00
Gravenstein, Samuel Hartwell,	3 00
Second, F. & L. Clapp,	2 00
Third, William Mackintosh,	1 00
Hubbardston Nonsuch, C. N. Brackett,	3 00
Second, Samuel Hartwell,	2 00
Third, Walter Russell,	1 00
Hunt Russet, Samuel Hartwell,	3 00
Second, John Cummings,	2 00
Third, John B. Moore,	1 00
King of Tompkins County, Asa Clement,	3 00
Second, Edwin Fletcher,	2 00
Third, C. N. Brackett,	1 00
Ladies' Sweet, Edwin Fletcher,	3 00
Second, Asa Clement,	2 00
Leicester Sweet, Asa Clement,	3 00
Second, O. B. Hadwen,	2 00
Lyscom, Samuel Hartwell,	3 00
Second, Asa Clement,	2 00
Maiden's Blush, John Cummings,	3 00
Second, Warren Fenno,	2 00

Minister, William T. Hall,	$3 00
Second, Asa Clement,	2 00
Mother, John Cummings,	3 00
Second, Edwin Fletcher,	2 00
Northern Spy, Amos Bates,	3 00
Second, John B. Moore,	2 00
Third, Asa Clement,	1 00
Porter, Edward Sumner,	3 00
Second, A. S. McIntosh,	2 00
Third, John Cummings,	1 00
Pumpkin Sweet, George W. Stevens,	3 00
Second, Asa Clement,	2 00
Rhode Island Greening, Horace Eaton,	3 00
Second, E. W. Wood,	2 00
Third, John Cummings,	1 00
Roxbury Russet, Edward Sumner,	3 00
Second, John L. De Wolf,	2 00
Third, Warren Heustis,	1 00
Washington Strawberry, J. C. Park,	3 00
Second, F. & L. Clapp,	2 00
Yellow Bellflower, Asa Clement,	3 00
Second, Joseph H. Bell,	2 00
CRAB APPLES. — Hyslop, E. W. Bettinson,	2 00
Transcendent, Horace Eaton,	2 00
Second, Horace Partridge,	1 00
PEARS. — Andrews, Horace Partridge,	3 00
Second, S. P. Langmaid,	2 00
Third, A. McDermott,	1 00
Bartlett, S. P. Langmaid,	3 00
Second, J. F. Nickerson,	2 00
Third, W. S. Janvrin,	1 00
Belle Lucrative, Isaac Oliver,	3 00
Second, Horace Eaton,	2 00
Third, W. P. Walker,	1 00
Beurre d'Anjou, S. P. Langmaid,	3 00
Second, W. S. Janvrin,	2 00
Third, William T. Hall,	1 00
Beurre Bosc, S. P. Langmaid,	3 00
Second, George S. Curtis,	2 00
Third, J. C. Park,	1 00
Beurre Clairgeau, Warren Fenno,	3 00
Second, Horace Partridge,	2 00
Third, W. S. Janvrin,	1 00
Beurre Diel, E. L. Draper,	3 00
Second, J. V. Wellington,	2 00
Beurre Gris d'Hiver Nouveau, Warren Fenno,	3 00
Second, E. W. Wood,	2 00

Beurre Hardy, Jesse Haley,	$3 00
Second, Charles F. Curtis,	2 00
Third, Warren Fenno,	1 00
Beurre Langelier, Amos Bates,	3 00
Second, Marshall P. Wilder,	2 00
Beurre Superfin, Lewis Slack,	3 00
Second, John L. Bird,	2 00
Third, T. M. Davis,	1 00
Buffum, J. F. Nickerson,	3 00
Second, John L. Bird,	2 00
Dana's Hovey, A. S. McIntosh,	3 00
Second, Alexander Dickinson,	2 00
Third, Benjamin G. Smith,	1 00
De Tongres, J. C. Park,	3 00
Second, John L. Bird,	2 00
Third, T. M. Davis,	1 00
Doyenne Boussock, Jacob Eaton,	3 00
Second, Marshall P. Wilder,	2 00
Third, E. W. Wood,	1 00
Doyenne du Comice, J. C. Park,	3 00
Second, W. P. Walker,	2 00
Third, Warren Fenno,	1 00
Duchesse d'Angouleme, Alexander Dickinson,	3 00
Second, John McClure,	2 00
Third, J. F. Nickerson,	1 00
Fulton, J. C. Park,	3 00
Second, John L. Bird,	2 00
Glout Morceau, J. F. Nickerson,	3 00
Second, Warren Fenno,	2 00
Third, John L. De Wolf,	1 00
Goodale, C. E. Grant,	3 00
Second, Alexander Dickinson,	2 00
Howell, Jesse Haley,	3 00
Second, W. S. Janvrin,	2 00
Third, Warren Fenno,	1 00
Lawrence, S. P. Langmaid,	3 00
Second, W. S. Janvrin,	2 00
Third, Warren Fenno,	1 00
Louise Bonne of Jersey, W. S. Janvrin,	3 00
Second, S. P. Langmaid,	2 00
Third, Alexander Dickinson,	1 00
Marie Louise, Alexander Dickinson,	3 00
Second, George Frost,	2 00
Third, John L. De Wolf,	1 00
Merriam, John L. De Wolf,	3 00
Second, A. S. McIntosh,	2 00
Third, Charles F. Curtis,	1 00

Mount Vernon, Walker & Co.,	$3 00
Second, Charles Bird,	2 00
Onondaga, or Swan's Orange, A. McDermott,	3 00
Second, W. P. Walker,	2 00
Third, Charles Bird,	1 00
Paradis d'Automne, W. S. Plimpton,	3 00
Second, John L. Bird,	2 00
Third, Marshall P. Wilder,	1 00
Seckel, G. M. Mellen,	3 00
Second, John L. Bird,	2 00
Third, George D. Putnam,	1 00
Sheldon, Mrs. M. T. Goddard,	3 00
Second, Charles F. Curtis,	2 00
Third, William A. Crafts,	1 00
Souvenir du Congrès, Warren Fenno,	3 00
Second, Marshall P. Wilder,	2 00
St. Michael Archangel, T. M. Davis,	3 00
Second, Walker & Co.,	2 00
Third, Jesse Haley,	1 00
Urbaniste, Jesse Haley,	3 00
Second, John L. De Wolf,	2 00
Third, Isaac Oliver,	1 00
Vicar of Winkfield, William T. Hall,	3 00
Second, W. S. Janvrin,	2 00
Winter Nelis, John L. Bird,	3 00
Second, Warren Fenno,	2 00
Third, W. P. Walker,	1 00
PEACHES. — Dish of any variety, J. L. D. Sullivan, for Crawford's Early,	3 00
Second, Mrs. M. T. Goddard,	2 00
Orchard House Culture, J. S. Amory, for Crawford's Late,	4 00
Second, John Falconer, for Rivers' Lord Palmerston,	3 00
NECTARINES. — Any variety, John Falconer, Rivers' Victoria,	3 00
Second, John Falconer, Rivers' Prince of Wales,	2 00
PLUMS. — Collection, not less than four varieties, Horace Eaton,	4 00
Dish of any variety, Mrs. H. V. Draper, Washington,	3 00
Second, John Falconer, Rivers' Sultan,	2 00
Third, John Falconer, Jefferson,	1 00
NATIVE GRAPES. — Six bunches of Concord, W. Doran & Son,	3 00
Second, George Hill,	2 00
Third, J. W. Talbot,	1 00
Creveling, S. G. Damon,	3 00
Delaware, Joseph S. Chase,	3 00
Second, Augustus Torrey,	2 00
Third, Warren Fenno,	1 00
Hartford, M. Darling, Jr.,	3 00
Second, J. W. Talbot,	2 00

Third, T. M. Davis,	$1 00
Any other early variety, Benjamin G. Smith,	3 00
Second, John B. Moore,	2 00
Third, S. G. Damon,	1 00
Foreign Grapes.—Six varieties, two bunches each, A. W. Nickerson,	10 00
Second, Benjamin G. Smith,	8 00
Third, Horace Partridge,	4 00
Four varieties, two bunches each, Henry C. Cooke,	8 00
Two varieties, two bunches each, Stiles Frost,	4 00
Third prize, Benjamin G. Smith,	2 00
Two bunches of any Black Grape, C. D. Kingman, Black Hamburg,	4 00
Second, John Falconer, Gros Maroc,	3 00
Third, Stiles Frost, Black Hamburg,	2 00
Two bunches of any White Grape, C. D. Kingman,	4 00

Gratuities: —

E. W. Wood, large Blue Pearmain Apples,	1 00
Edward Sumner, Morrison's Red "	1 00
J. C. Park, Alexander "	1 00
O. B. Hadwen, Mexico "	1 00
John B. Moore, collection of "	3 00
Samuel Hartwell, " "	3 00
Edwin Fletcher, " "	3 00
Josiah Newhall, "	2 00
A. Hatch, "	2 00
J. W. Talbot, "	1 00
C. N. Brackett, "	1 00
Abraham B. Shedd, "	1 00
S. N. Gaut, "	1 00
Benjamin G. Smith, Apples and Pears,	3 00
John Cummings, " "	3 00
Warren Fenno, " "	3 00
Francis B. Hayes, " "	2 00
Benjamin F. Hunt, Jr., Pears,	2 00
S. N. Gaut, "	2 00
James Cruickshanks, "	2 00
Horace Partridge, "	1 00
C. E. Grant, "	1 00
M. W. Chadbourne, "	1 00
John B. Moore, "	1 00
J. S. Richards, "	1 00
John Falconer, Pears, Apples, and Peaches,	2 00
Mrs. Lorenzo Sabine, Seedling Peaches,	1 00
Benjamin G. Smith, Foreign Grapes,	1 00
James H. Ricketts, collection of Seedling Grapes,	3 00

SEPTEMBER 27.

Gratuity: —

C. H. Johnson, fine Seedling Peaches, ... $1 00

OCTOBER 5.

PEARS. — Beurre Bosc, W. H. M. Austin, ... 3 00
Second, T. M. Davis, ... 2 00
Third, W. S. Janvrin, ... 1 00
Beurre Clairgeau, Warren Fenno, ... 3 00
Second, John McClure, ... 2 00
Third, Horace Partridge, ... 1 00
Beurre Diel, Walker & Co., ... 3 00
Second, Edwin A. Hall, ... 2 00
Third, T. M. Davis, ... 1 00
Doyenne du Comice, W. S. Janvrin, ... 3 00
Second, Walker & Co., ... 2 00
Third, John McClure, ... 1 00
Duchesse d'Angouleme, S. G. Damon, ... 3 00
Second, John McClure, ... 2 00
Third, Edwin A. Hall, ... 1 00
Louise Bonne of Jersey, T. M. Davis, ... 3 00
Second, W. T. Hall, ... 2 00
Third, Edwin A. Hall, ... 1 00
Urbaniste, Walker & Co., ... 3 00
Second, S. P. Langmaid, ... 2 00
Third, John L. Bird, ... 1 00
APPLES. — Fall Orange, or Holden Pippin, Asa Clement, . . . 3 00
Second, Edwin Fletcher, ... 2 00
Gravenstein, Asa Clement, ... 3 00
Second, Samuel Hartwell, ... 2 00
Mother, John Cummings, ... 3 00
Second, Edwin Fletcher, ... 2 00
Porter, A. S. McIntosh, ... 3 00
Second, John Cummings, ... 2 00
NATIVE GRAPES. — Six bunches of Agawam, C. F. Holt, . . . 3 00
Second, Warren Fenno, ... 2 00
Concord, W. Doran & Son, ... 3 00
Second, Cephas H. Brackett, ... 2 00
Third, Moses Darling, Jr., ... 1 00
Diana, M. H. Merriam, ... 3 00
Second, Isaac P. Langworthy, ... 2 00
Isabella, J. V. Wellington, ... 3 00
Second, C. E. Grant, ... 2 00
Massasoit, Cephas H. Brackett, ... 3 00
Wilder, Cephas H. Brackett, ... 3 00
Second, Joseph S. Chase, ... 2 00

Foreign Grapes. — Three varieties, two bunches each, E. W. Wood,	$5 00
Second, H. C. Cooke,	4 00
Two bunches of any variety, E. W. Wood, Black Hamburg,	3 00
Second, Stiles Frost,	2 00
Quinces. — Any variety, W. S. Janvrin,	3 00
Second, Benjamin G. Smith,	2 00
Third, Horace Eaton,	1 00

Gratuities : —

Horace Partridge, Grapes and Peaches,	2 00
Benjamin G. Smith, Foreign and Native Grapes,	2 00
C. E. Grant, Grapes,	1 00
Edwin Fletcher, Apples,	1 00
Benjamin Cushing, Clapp's Seedling Pear, Harris,	1 00
B. F. Wing, fine Marie Louise Pears,	1 00
John McClure, very fine Sheldon Pears,	1 00
Benjamin G. Smith, Apples and Pears,	1 00

October 26.

Gratuity : —

F. & L. Clapp, collection of Seedling Pears,	2 00

November 9.

Pears. — Beurre d'Anjou, W. S. Janvrin,	3 00
Second, John C. Park,	2 00
Third, Warren Fenno,	1 00
Dana's Hovey, A. S. McIntosh,	3 00
Second, Alexander Dickinson,	2 00
Third, Hovey & Co.,	1 00
Lawrence, S. P. Langmaid,	3 00
Second, David B. Flint,	2 00
Third, Jesse Haley,	1 00
Winter Nelis, John McClure,	3 00
Second, T. M. Davis,	2 00
Third, Alexander Dickinson,	1 00

French Premiums

Apples. — Baldwin, C. C. Shaw,	3 00
Second, Leonard W. Weston,	2 00
Hubbardston Nonsuch, M. W. Chadbourne,	3 00
Second, Walter Russell,	2 00

Hunt Russet, Asa Clement,	$3 00
Second, John B. Moore,	2 00
King of Tompkins County, Edwin Fletcher,	3 00
Second, Asa Clement,	2 00
Northern Spy, W. T. Hall,	3 00
Second, C. C. Shaw,	2 00
Rhode Island Greening, Edwin Fletcher,	3 00
Second, Horace Eaton,	2 00
Roxbury Russet, Cephas H. Brackett,	3 00
Second, Mrs. C. N. S. Horner,	2 00

REPORT

OF THE

Committee on Vegetables,

FOR THE YEAR 1878.

By C. N. BRACKETT, Chairman.

The past season has been an unusually favorable one for the various productions of the vegetable garden. The crops have not only been abundant, but have, with few exceptions, been above the general average in quality.

Seldom have we seen finer or better grown specimens than have been placed upon our tables at the weekly exhibitions the past season. We note with great pleasure the gradual improvement in the quality of the vegetables offered for our inspection from year to year, and are led to infer that more attention is being paid at the present time than formerly, to the great importance of pure and reliable seed, as the starting point to success and profit with the intelligent cultivator. Careful culture, and the employment of the requisite amount of proper fertilizers, are, of course, necessary to the perfection of a crop; and by rendering plants healthy and vigorous, and enabling them to withstand the vicissitudes of temperature in a climate like ours, will do much to insure it, but they will not wholly avail, if the cultivator allows himself to start with inferior or even *doubtful* seed; when his harvest comes, disappointment and loss are as sure to follow as day to follow night. This is a matter of great importance, too often overlooked, and which cannot be too frequently impressed upon cultivators, if they desire to promote what most aim at in life,—their own pecuniary interests.

The exhibitions of forced vegetables during the earlier portion of the year, from January to April, were the most meagre we remember to have seen for several years. The improvement hoped for at these exhibitions in a former report has not been realized. With the exception of a few fine specimens of Tennisball Lettuce from George F. Stone, J. B. Moore, Josiah Crosby, and Walter Russell, and Cucumbers and Rhubarb from Cephas H. Brackett, there was nothing offered worthy of special mention until the Azalea Exhibition, which occurred April 6th. From this time up to the Annual Exhibition, in September, the weekly shows were generally very fine. Very few inferior specimens were to be found on our tables during the entire season, which is more than can be said of some former years, and is certainly creditable to our contributors.

A few vegetables, new to your Committee, have been shown for the first time on our tables the past season, prominent among which was a new variety of Rhubarb, exhibited by John C. Hovey, June 1st, and called the Monarch. The specimens shown were very large and handsome, and received the first prize.

July 13th Samuel G. Stone exhibited a new variety of Sweet Corn, under the name of Early Minnesota. It is a small but very early variety, and said to be of good quality, and may, on account of its earliness, prove of value for the kitchen garden, although we should consider it rather too small for a profitable market variety.

On the same day C. M. Atkinson showed a very handsome new variety of Pea, called Carter's Challenger. Your Committee were very much pleased with its appearance, and hope to see it in other collections the coming year.

June 15th M. W. Chadbourne showed a very fine collection of Peas, consisting of the following varieties, viz.: Carter's First Crop, Premium Little Gem, and Alpha.

June 26th the first and second prizes for Peas were awarded for Alpha, and the third for William First. In addition to the above named varieties, we also noticed the following sorts, which were shown from time to time: Hill's Early, by Josiah Crosby; Caractacus, by Samuel Hartwell; Kentish Invicta, by S. G. Stone; McLean's Advancer, by Walter Russell and others; and Commander-in-Chief, by M. W. Chadbourne. The first prize for Lima Beans was again awarded to Benjamin G. Smith, who seems

to distance all competitors. Mr. Smith also carried off the first prize for Limas at the Annual Exhibition. His specimens were very fine; he has got the *pole*, and evidently intends to keep it, — filled with his splendid specimens, in readiness to sweep the board of all the first prizes in the future.

The display at the Annual Exhibition, although much smaller than on many previous occasions, was, on the whole, satisfactory in its character. The falling off at this exhibition is accounted for by the fact that several, who have heretofore been among our largest and most constant contributors to these exhibitions for many years, failed, for some cause, to put in an appearance. This was, of course, to be regretted, as it is always desirable at our annual shows to have all the space devoted to this department well filled. Although lacking in quantity, in comparison with the previous year, the deficiency was more than made up by the excellence of the specimens shown. It was the general remark that root crops were the best and most perfect ever shown at any exhibition of the Society.

The show of Tomatoes was, considering the lateness of the season, remarkably full and fine. There were eighty different dishes, representing all the leading varieties. The collection of John Cummings was the largest and best. His specimens of Boston Market, Gen. Grant, Emery, and Paragon, were fully up to the standard, and were much admired by all who entered the hall. Samuel Hartwell and J. J. H. Gregory, each showed a large collection of very fine specimens. The first prizes for the best three varieties, and best single dishes, were all won by Mr. Cummings.

The display of Potatoes, although not large, was unusually fine. The specimens shown were uniform in size, smooth, and well grown. The whole number of dishes was twenty-six, prominent among which were the Early Rose, Snow Flake, Early Vermont, Burbank's Seedling, Early Ohio, and Dunmore's Seedling. The prize for the best collection of new seedlings was not awarded, none being exhibited.

The Squash family was also well represented at this exhibition. The specimens of the different varieties showed a nearer approach to the desired standard of excellence than has been the case at any former show

Cauliflowers were not up to the usual standard at this exhibition, although some excellent specimens were shown later in the season.

We are indebted to I. P. Dickinson, of Springfield, Mass., for the best collection of Watermelons ever seen in our hall. They were noble specimens, weighing upwards of fifty pounds each, and were much admired. Mr. Dickinson swept the board, taking all the prizes, first, second, and third, and would have taken a fourth, had one been offered. Greenflesh melons, owing to the lateness of the season, were not up to the average; most of the specimens were small, somewhat spotted, and not equal to those seen at the weekly exhibitions during the month of August.

Before concluding our report we would call the attention of contributors to, important changes in the Schedule of Prizes for 1879. It will be noticed, on referring to the Schedule, that it has been found necessary to make a still further reduction in the amount appropriated for prizes and gratuities, in this department, for the coming year. Also, that the number of prize exhibitions has been reduced to five; the first in March, the second and third in June, the fourth — the Annual Exhibition — in September, and the fifth in November. The amount placed at the disposal of this Committee is $500, which sum has been divided in such manner as to make each of these exhibitions as full and interesting as possible. The prize list for the Annual Exhibition in September remains much the same as this year. One hundred dollars of the appropriation is reserved, to be awarded in gratuities for such worthy objects as may be exhibited during the interval from June to September, when no prizes are offered.

There has been a considerable falling off in the number of contributors during the past year, as compared with the two previous years. In 1876 premiums and gratuities were awarded to sixty-seven different persons; in 1877 to sixty-two, and in 1878 to fifty-four.

The amount appropriated for Prizes and Gratuities the past year, was		$750 00
Awarded in Prizes,	$503 00	
Awarded in Gratuities,	167 00	
Total amount of awards,		670 00
Balance unexpended,		$80 00

The annexed list shows the Prizes and Gratuities awarded by your Committee during the year.

All of which is respectfully submitted.

C. N. Brackett,
Walter Russell,
George W. Pierce,
John Fillebrown,
Josiah Crosby,
Anthony Hatch,
Samuel Hartwell,

Committee on Vegetables.

PRIZES AND GRATUITIES FOR VEGETABLES.

JANUARY 19.

Gratuity : —

George F. Stone, Lettuce and Dandelions, ... $1 00

JANUARY 26.

Gratuity : —

John B. Moore, Lettuce, ... 1 00

FEBRUARY 2.

Gratuity : —

J. B. Moore, Lettuce, ... 1 00

FEBRUARY 9.

Gratuity : —

J. B. Moore, Lettuce, ... 1 00

FEBRUARY 16.

Gratuity : —

Cephas H. Brackett, Cucumbers and Rhubarb, ... 2 00

FEBRUARY 23.

Gratuities : —

J. H. Bell, collection, ... 2 00
J. B. Moore, Lettuce, ... 1 00

MARCH 2.

Gratuities : —

J. B. Moore, Lettuce, ... 1 00
George Hill, " 1 00
C. H. Brackett, Rhubarb and Cucumbers, ... 2 00
Josiah Crosby, collection, ... 2 00
C. B. Gardiner, Mushrooms, ... 1 00

MARCH 9.

Gratuity : —

Josiah Crosby, collection, ... 2 00

MARCH 16.

Gratuity: —

Walter Russell, collection,	$2 00

AZALEA EXHIBITION.

APRIL 6.

CUCUMBERS. — Pair of White Spine, C. H. Brackett,	3 00
LETTUCE. — Four heads of Tennisball, George F. Stone,	3 00
Second, Josiah Crosby,	2 00
Third, Charles Garfield,	1 00
RADISHES. — Four bunches of Turnip Rooted, J. H. Bell,	3 00
RHUBARB. — Twelve stalks, J. H. Bell,	3 00
PARSLEY. — Two quarts, "	3 00
MUSHROOMS. — Twenty-four specimens, C. B. Gardiner,	3 00

Gratuity: —

A. S. McIntosh, Artichokes,	1 00

APRIL 20.

Gratuity: —

Charles Garfield, Lettuce,	1 00

APRIL 27.

Gratuities: —

M. W. Chadbourne, Rhubarb,	2 00
George Dorr, "	1 00

MAY 4.

Gratuities: —

A. S. McIntosh, Artichokes,	1 00
J. B. Moore, Asparagus,	2 00
Charles Garfield, Lettuce,	1 00

MAY 11.

Gratuities: —

J. B. Moore, Asparagus,	2 00
Samuel Hartwell, Asparagus and Rhubarb,	2 00

MAY 25.

Gratuities: —

Walter Russell, Radishes,	1 00
Samuel Hartwell, collection,	2 00
George F. Stone, Lettuce,	1 00

JUNE 1.

ASPARAGUS. — Four bunches, J. B. Moore,	$3 00
Second, Samuel Hartwell,	2 00
Third, L. W. Weston,	1 00
CUCUMBERS. — Pair, Josiah Crosby,	3 00
Second, J. H. Bell,	2 00
RHUBARB. — Twelve stalks, J. C. Hovey, Monarch,	3 00
Second, Samuel Hartwell, Victoria,	2 00
Third, A. D. Capen, Linnæus,	1 00
RADISHES. — Four bunches of Long Scarlet, Josiah Crosby,	3 00
LETTUCE. — Four heads, J. B. Moore,	3 00
Second, Josiah Crosby,	2 00
Third, George F. Stone,	1 00
CARROTS. — Twelve, Josiah Crosby,	3 00
BEETS. — Twelve, J. Crosby,	3 00
Gratuity: —	
C. H. Brackett, Tomatoes,	1 00

JUNE 15.

Gratuities: —	
M. W. Chadbourne, collection of Peas,	2 00
Samuel Hartwell, Peas,	1 00

JUNE 19.

Gratuities: —	
M. W. Chadbourne, three varieties of Peas,	2 00
W. C. Child, collection of "	2 00
Samuel G. Stone, Kentish Invicta "	1 00
Samuel Hartwell, Caractacus "	1 00
C. E. Grant, Carter's First Crop "	1 00
Josiah Crosby, Hill's Early "	1 00
C. H. Brackett, White Spine Cucumbers,	1 00
George Hill, Dewing's Early Beets,	1 00
J. B. Moore, Lettuce,	1 00
Josiah Crosby, collection of seven varieties of Vegetables,	5 00

STRAWBERRY SHOW.

JUNE 26.

PEAS. — One peck, M. W. Chadbourne, Alpha,	3 00
Second, J. H. Bell, Alpha,	2 00
Third, M. W. Chadbourne, William First,	1 00

BEETS. — Twelve Turnip Rooted, George Hill, Dewing's, . . $3 00
Second, Walter Russell, " . . . 2 00
Egyptian, J. Crosby, ... 3 00
Second, George Hill, ... 2 00
Third, Anthony Hatch, ... 1 00
CUCUMBERS. — Pair of White Spine, Cephas H. Brackett, . . 3 00
Second, George Hill, ... 2 00
Third, Walter Russell, ... 1 00
LETTUCE. — Any variety, George Hill, ... 3 00
Second, Walter Russell, ... 2 00
Third, Anthony Hatch, ... 1 00
ONIONS. — Twelve, Josiah Crosby, ... 3 00
CARROTS. — Twelve Intermediate, J. Crosby, ... 3 00
Second, Walter Russell, ... 2 00

Gratuities: —

M. W. Chadbourne, Early Rose Potatoes, ... 2 00
C. D. Kingman, " " " 1 00
C. H. Brackett, Tomatoes, ... 1 00
Walter Russell, Cabbages and Radishes, ... 2 00
Josiah Crosby, " " Carrots, ... 2 00
C. E. Grant, Peas, ... 1 00

JUNE 29.

Gratuity: —

M. W. Chadbourne, collection of Peas, ... 1 00

JULY 6.

CRANBERRY BEANS. — One peck, Josiah Crosby, ... 3 00
SQUASHES. — Four Long Warted Summer, J. Crosby, . . . 3 00
Second, George Hill, ... 2 00
Third, Walter Russell, ... 1 00
PEAS. — One peck, J. B. Moore, Carter's Challenger, . . . 3 00
Second, Walter Russell, Advancer, ... 2 00
Third, S. G. Stone, " 1 00
ONIONS. — Twelve, J. Crosby, ... 3 00
POTATOES. — One peck, S. G. Stone, Early Rose, ... 3 00
Second, G. M. Mellen, " 2 00
CABBAGES. — Four, Josiah Crosby, Henderson, ... 3 00
Second, George Hill, " 2 00
Third, W. Russell, Wyman, ... 1 00

Gratuity: —

M. W. Chadbourne, Potatoes, ... 1 00

JULY 13.

POTATOES. — One peck, M. W. Chadbourne, Early Rose,	$3 00
Second, Horace Partridge, "	2 00
Gratuities: —	
Josiah Crosby, Cabbages,	2 00
C. M. Atkinson, Carter's Challenger Peas,	1 00
M. W. Chadbourne, "	1 00
Charles Garfield, Valentine Beans,	1 00
Samuel G. Stone, Minnesota Corn,	2 00
Francis B. Hayes, Lettuce,	1 00

JULY 20.

SWEET CORN. — Twelve ears, S. G. Stone, Early Minnesota,	3 00
Second. S. Hartwell, Narragansett,	2 00
Third, S. G. Stone, Crosby,	1 00
SQUASHES. — Four Marrow, J. Crosby,	3 00
CABBAGES. — Four Drumhead, J. Crosby,	3 00
TOMATOES. — Twelve, George W. Pierce, Emery,	3 00
Gratuities: —	
C. D. Kingman, Gen. Grant Tomatoes,	1 00
Mrs. E. M. Gill, Wax Beans,	1 00
George M. Mellen, " "	1 00

JULY 27.

TOMATOES. — Twelve, A. D. Capen,	3 00
SWEET CORN. — Twelve ears, J. Crosby,	3 00
Second, L. W. Weston,	2 00
Third, S. Hartwell,	1 00
Gratuities: —	
G. M. Mellen, Early Rose Potatoes,	1 00
W. H. Spooner, Golden Butter Beans,	1 00
Mrs. E. M. Gill, Horticultural Beans,	1 00
Francis B. Hayes, Cos Lettuce,	1 00

AUGUST 3.

SWEET CORN. — Twelve ears, Josiah Crosby,	3 00
Second, L. W. Weston,	2 00
Third, J. H. Bell,	1 00
SQUASHES. — Four Marrow, Josiah Crosby,	3 00
TOMATOES. — Twelve Gen. Grant, J. H. Bell,	3 00
Second, C. N. Brackett,	2 00

Boston Market, A. D. Capen,	$3 00
Second, M. W. Chadbourne,	2 00
Any other variety, Charles Garfield, Trophy,	3 00
Second, J. H. Bell, Emery,	2 00
Gratuities: —	
G. M. Mellen, Corn and Tomatoes,	1 00
S. G. Stone, Minnesota Corn,	1 00
S. Hartwell, Crosby "	1 00

AUGUST 10.

EGG PLANTS. — Four Large Round Purple, John B. Moore,	3 00
GREENFLESH MELONS. — Four, George Hill,	3 00
MUSKMELONS. — Four, J. H. Bell,	3 00
Gratuities:	
Samuel G. Stone, Stowell's Evergreen Corn,	1 00
John Cummings, Tomatoes,	1 00
Mrs. E. M. Gill, "	1 00
S. Hartwell, Potatoes and Corn,	1 00
M. W. Chadbourne, Tomatoes and Corn,	1 00
Charles Garfield, " " "	1 00

AUGUST 17.

GREENFLESH MELONS. — Four, Warren Heustis,	3 00
Second, Walter Russell,	2 00
Third, George Hill,	1 00
MUSKMELONS. — Four, J. H. Bell,	3 00
Second, George Hill,	2 00
EGG PLANTS. — Four Large Round Purple, J. B. Moore,	3 00
Second, Walter Russell,	2 00
Third, Josiah Crosby,	1 00
Gratuities: —	
George M. Mellen, Tomatoes,	1 00
Mrs. E. M. Gill, "	1 00
Charles Garfield, "	1 00
Josiah Crosby, Greenflesh Melons,	1 00
Samuel Hartwell, Muskmelons,	1 00
" " Burr's Corn,	1 00
C. E. Grant, Lima Beans and Corn,	2 00
C. N. Brackett, Squash Peppers,	1 00
B. K. Bliss, Asparagus,	1 00

AUGUST 24.

BEANS. — Two quarts Large Lima, B. G. Smith,	3 00
Second, Samuel Hartwell,	2 00
Third, C. E. Grant,	1 00

PEPPERS. — Twelve, C. N. Brackett,	$3 00
Second, Josiah Crosby,	2 00
Third, James Bard,	1 00
Gratuities: —	
J. B. Moore, collection,	3 00
A. D. Capen, collection of Tomatoes,	1 00
J. Cummings, Corn and Tomatoes,	2 00
C. E. Grant, " " "	1 00
Mrs. E. M. Gill, collection of Beans,	1 00
C. M. Atkinson, Champion of England Peas,	1 00
S. Hartwell, Muskmelons,	1 00
S. G. Stone, Lima Beans,	1 00

AUGUST 31.

WATERMELONS. — Pair, S. Hartwell, Mountain Sprout,	3 00
Second, J. H. Bell, Black Spanish,	2 00
Third, S. Hartwell, Mountain Sweet,	1 00
GREENFLESH MELONS. — Four, J. B. Moore,	3 00
Second, J. H. Bell,	2 00
Third, Warren Heustis,	1 00
Gratuities: —	
Josiah Crosby, Celery,	2 00
W. C. Child, Lima Beans,	1 00
C. E. Grant, Cocoanut Squashes,	1 00
Mrs. E. M. Gill, collection of Beans,	1 00
John Cummings, collection,	3 00
Samuel Hartwell, "	2 00
J. B. Moore, "	2 00

SEPTEMBER 7.

CELERY. — Four roots, Josiah Crosby,	3 00
SALSIFY. — Twelve, Walter Russell,	3 00
Second, John Cummings,	2 00
CAULIFLOWERS. — Four, John Cummings,	3 00
Gratuities: —	
J. B. Moore, Greenflesh Melons,	1 00
G. M. Mellen, Squashes,	1 00
D. R. Beckford, Jr., Tomatoes,	1 00
C. Terry, Potatoes,	1 00
Samuel G. Stone, Lima Beans,	1 00
Samuel Hartwell, "	1 00
Charles Garfield, collection,	1 00
J. Cummings, "	1 00
Mrs. E. M. Gill, "	2 00
A. D. Capen, "	1 00

ANNUAL EXHIBITION.

SEPTEMBER 17, 18, 19, AND 20.

BEETS. — Turnip Rooted, George F. Stone,	$3 00
Second, Walter Russell,	2 00
Third, M. W. Chadbourne,	1 00
CARROTS. — Long Orange, Walter Russell,	3 00
Second, Josiah Crosby,	2 00
Third, John Cummings,	1 00
Intermediate, Walter Russell,	3 00
Second, Josiah Crosby,	2 00
Third, John Cummings,	1 00
CORN. — Sweet, James Comley,	3 00
Second, John Cummings,	2 00
Third, Mrs. E. M. Gill,	1 00
Field Corn, Mrs. M. T. Goddard,	3 00
Second, C. N. Brackett,	2 00
Third, J. B. Tilley,	1 00
CAULIFLOWERS. — Four, John Cummings,	4 00
Second, J. B. Moore,	3 00
CELERY. — Four roots, Josiah Crosby,	4 00
Second, Walter Russell,	3 00
TOMATOES. — Three varieties, J. Cummings,	4 00
Second, J. Cummings,	3 00
Third, Samuel Hartwell,	2 00
Arlington, J. Cummings,	2 00
Second, S. Hartwell,	1 00
Boston Market, J. Cummings,	2 00
Second, S. Hartwell,	1 00
Emery, J. Cummings,	2 00
Second, S. Hartwell,	1 00
Gen. Grant, J. Cummings,	2 00
Second, S. Hartwell,	1 00
Any other variety, J. Cummings, Paragon,	2 00
Second, J. J. H. Gregory, Paragon,	1 00
OKRA. — Twenty-four, Mrs. M. T. Goddard,	2 00
MARTYNIAS. — Twenty-four, G. W. Pierce,	2 00
Second, Anthony Hatch,	1 00
CRANBERRIES. — Half-peck, O. M. Holmes,	3 00
GREENFLESH MELONS. — Four, J. H. Bell,	3 00
Second, Edward Sumner,	2 00
Third, S. Hartwell,	1 00
WATERMELONS. — Pair, I. P. Dickinson, Excelsior,	3 00
Second, " " Gypsy,	2 00
Third, " " Black Spanish,	1 00

BEANS. — Large Lima, B. G. Smith,	$3 00
Second, M. H. Merriam,	2 00
Third, S. Hartwell,	1 00
PARSNIPS. — Long, W. A. Crafts,	3 00
Second, M. W. Chadbourne,	2 00
Third, John L. De Wolf,	1 00
POTATOES. — Four varieties, Mrs. M. T. Goddard,	4 00
Second, John Cummings,	3 00
Early Rose, J. L. De Wolf,	3 00
Second, J. Cummings,	2 00
Third, J. B. Moore,	1 00
Snow Flake, Walter Russell,	3 00
Second, J. L. De Wolf,	2 00
Third, J. Cummings,	1 00
Any other variety, Mrs. M. T. Goddard, King of the Earlies,	3 00
Second, W. Russell, Early Vermont,	2 00
Third, J. Cummings, Eureka,	1 00
SALSIFY. — Twelve, W. A. Crafts,	3 00
Second, J. L. De Wolf,	2 00
Third, Walter Russell,	1 00
SQUASHES. — Canada, C. E. Calder,	3 00
Second, Mrs. M. T. Goddard,	2 00
Third, W. A. Crafts,	1 00
Hubbard, George Hill,	4 00
Second, Walter Russell,	3 00
Third, J. Cummings,	2 00
Marblehead, J. J. H. Gregory,	4 00
Second, George Hill,	3 00
Third, John Cummings,	2 00
Marrow, George Hill,	4 00
Second, C. E. Calder,	3 00
Third, J. Cummings,	2 00
Turban, J. Cummings,	4 00
Second, J. J. H. Gregory,	3 00
Third, John Sias,	2 00
Largest and best Mammoth, not less than 100 lbs., the Society's Bronze Medal, to Josiah Newhall; weight of specimen, 160 lbs.	
TURNIPS. — Twelve, S. Hartwell,	3 00
Second, Mrs. M. T. Goddard,	2 00
Swedish, S. Hartwell,	3 00
Second, Mrs. M. T. Goddard,	2 00
CABBAGES. — Drumhead, J. Cummings,	4 00
Second, Walter Russell,	3 00
Third, J. B. Tilley,	2 00
Red, J. Cummings,	4 00
Second, Mrs. M. T. Goddard,	3 00

Savoy, J. Cummings,	$4 00
Second, J. B. Tilley,	3 00
Third, Walter Russell,	2 00
HORSERADISH. — Six roots, Walter Russell,	3 00
PEPPERS. — Twenty-four, C. N. Brackett,	3 00
Second, Walter Russell,	2 00
Third, Josiah Crosby,	1 00
ONIONS. — Danvers Yellow, George Hill,	3 00
Second, Walter Russell,	2 00
Third, J. Cummings,	1 00
Red, Walter Russell,	3 00
Second, S. Hartwell,	2 00
Third, J. J. H. Gregory,	1 00
Portugal, Josiah Crosby,	3 00
EGG PLANT. — Large Purple, Walter Russell,	3 00
Second, George W. Pierce,	2 00
Third, J. B. Moore,	1 00
Gratuities: —	
M. H. Merriam, Cayenne Peppers,	1 00
James Comley, " "	1 00
Mrs. E. M. Gill, Lima Beans,	1 00
Charles Garfield, " "	1 00
J. Gardiner, Kidney Beans,	1 00
John B. Turner, collection of Beans,	1 00
C. M. Atkinson, Lettuce,	1 00
D. R. Beckford, Jr., Tomatoes,	1 00
G. W. Pierce, collection of Tomatoes,	1 00
J. J. H. Gregory, Butman Squashes,	1 00
Lewis Slack, Canada "	1 00
Walter Russell, Parsley,	1 00
M. W. Chadbourne, collection,	3 00
C. E. Grant, "	1 00
J. H. Bell, "	1 00
Josiah Newhall, "	1 00
Julius R. Wakefield, collection of Gourds,	1 00

OCTOBER 5.

CAULIFLOWERS. — Four, John B. Moore,	3 00
Second, John Cummings,	2 00
Third, Walter Russell,	1 00
CELERY. — Four roots, Walter Russell,	3 00
Second, Josiah Crosby,	2 00
CABBAGES. — Drumhead, J. Cummings,	3 00
Second, W. S. Janvrin,	2 00
Red, John Cummings,	3 00
Savoy, " "	3 00
Second, Walter Russell,	2 00

Salsify. — Twelve, Walter Russell,	$3 00
Second, F. B. Hayes,	2 00
Horseradish. — Six roots, Walter Russell,	3 00

Gratuities: —

F. B. Hayes, Mushrooms,	1 00
C. E. Calder, Lettuce,	1 00
C. E. Grant, collection,	1 00
Samuel Hartwell, Tomatoes,	1 00
Benjamin G. Smith, Lima Beans,	1 00
Samuel G. Stone, " "	1 00

October 19.

Gratuities: —

Josiah Crosby, Celery,	1 00
F. B. Hayes, Mushrooms,	1 00

October 26.

Gratuity: —

Samuel G. Stone, Lima Beans,	1 00

November 9.

Gratuities: —

C. E. Grant, collection,	1 00
A. S. McIntosh, Artichokes,	1 00
F. B. Hayes, Mushrooms,	1 00

REPORT

OF THE

COMMITTEE ON GARDENS,

FOR THE YEAR 1878.

By JOSEPH H. WOODFORD, CHAIRMAN.

Your Committee have been fortunate this year in receiving invitations to inspect two estates not entered for prizes. The first visit was on the 24th of May, to C. S. Sargent's, at Brookline. This estate consists of over one hundred and thirty acres, situated in the most delightful part of the town. The surface of the ground is undulating, and its natural advantages have been judiciously utilized by the tasteful grouping of trees, shrubs, and plants. American and foreign evergreens, and choice Chinese and Japan shrubs and trees are to be seen in profusion, giving an air of refined taste to the whole estate. Choice azaleas, rhododendrons, and palms, resplendent with bloom and fine foliage, were elegantly arranged under a huge tent, and proved wonderfully attractive, probably more so than usual, to the thousands of people who annually visit this beautiful estate. The Fernery, and arrangement of plants in it, caused many exclamations of pleasure and delight. Groupings of echeverias and agaves were also much admired. In fact, the whole place presented an appearance of great study, and the successful combination of natural advantages with skilled art in the management of trees and shrubs, and laying out of the grounds. Mr. Sargent, in the largeness of his heart, annually throws his grounds open to the public; and multitudes

avail themselves of his generous hospitality, and will forever bless his name for giving them days of restful pleasure amid the beauties he has culled from every clime.

To Mr. Sargent your Committee are much indebted, and beg to thank him most heartily for the noble example he maintains from year to year for others to emulate, and for the joy he dispenses broadcast to the many visitors who annually appreciate such generosity and hospitality.

The second visit was made on the 22d of June, to the "Hermitage," the delightful residence of William Gray, Jr., the President of our Society. The weather was decidedly cold and rainy, yet there was a goodly gathering of the veterans of the Society on this occasion, and a cordial welcome was extended to us as we entered Mr. Gray's hospitable mansion. A good fire of hickory logs was burning on the hearth, and boxes of elegant roses adorned the reception room. After the company had been regaled with a bountiful collation, the rain ceased, and an inspection of the estate began. The naturally undulating surface of the ground had been made more beautiful by careful tilth, and the judicious grouping of trees and shrubs. The whole surface of the estate not covered by trees, or under cultivation, was a close shaven lawn, in excellent condition, and presenting the appearance of a rich green carpet, not only to the eye but to the feet.

Rhododendrons, and other choice foreign and American evergreens, were planted with good taste, and the grouping of tropical and native shrubery and trees was very skilfully done. A spacious tent, which is to remain a permanent fixture, covered a very pretty tropical garden of palms and ferns, grouped in the happiest manner.

The rose garden presented a remarkably vigorous growth of the finest imported plants, some of them showing blooms exceeding five inches in diameter.

On the whole the estate presented a well kept and splendid appearance, and is just such a place as gentlemen of refined taste delight in occupying.

On the 23d day of July your Committee visited the garden of William Doran & Son, at Brookline, which was entered in competition, as a Garden of Small Fruits. This garden consists of two acres of land, which has been brought under cultivation by great

toil and perseverance by the present proprietor, and is entirely devoted to the cultivation of small fruits.

The different kinds of strawberries grown were Downer's Seedling, Lady of the Lake, Kentucky, Wilson, Col. Cheney, and Jucunda, and about 1700 quarts are annually marketed.

The currants were of the following kinds: Versailles, Dutch, Cherry, and Champagne; and the crop was estimated at 2500 quarts. The cultivation was such as to prolong the crop, thereby realizing better prices than could be obtained during the height of the season.

The raspberries consisted of Antwerp, Franconia, and Highland Hardy. The crop was being marketed at the time of our visit, and would amount to about 1200 quarts.

The grapes under cultivation were Concord, and Doran's Seedling, both promising good crops. The usual quantity marketed is about 1000 pounds.

Mr. Doran assured the Committee that the labor of fitting the ground for planting, and of planting and cultivation, had all been performed by himself and family, and that he is now receiving the reward of his labor in a comfortable subsistence from the product of his two acres. It was voted to award him a gratuity of ten dollars, as a slight token of our appreciation of his perseverance and success in small fruit gardening.

On Friday, the 9th of August, your Committee, together with other gentlemen, members of our Society, paid a second visit to the large estate of Francis B. Hayes, at Lexington, which was last year entered for the Hunnewell Triennial Premium. The day proved very boisterous and rainy, deterring a good many of the veterans in horticulture from venturing out; yet, notwithstanding the inclemency of the weather, more than thirty members responded to Mr. Hayes' kind invitation, and were amply repaid for so doing. While we were going over the place, and had ascended to the top of Granny's Hill, which was fully half a mile from any shelter, a most terrific storm of rain and hail burst upon us, completely putting a damper on our spirits for the time being, and making our walk around the farm not very agreeable. When the storm ceased, we resumed our inspection, freely commenting upon the beauties of the place, and discussing the various improvements in contemplation; after which we all again gathered at the mansion, where we were hospitably entertained before leaving to take the train for

Boston. At a subsequent visit to this place by your Chairman, and another member of the Committee, we found other improvements going forward and in contemplation, which will add, when completed, new beauties to this grand estate, and afford greater pleasure to future visitors. Some of these improvements consisted in the removal of rhododendron beds to better locations, with the addition of new and very large plants; new beds of azaleas of the best kinds, and numerous other ornamental trees and shrubs, and the making of a new lawn southeast of the mansion. The present aim of Mr. Hayes seems to be the accumulation of vast quantities of valuable trees and shrubs, with which he will in time make his ample grounds even more beautiful than now, and more attractive to the visitor. The flower plats and borders were in good condition, and the whole estate showed by its keeping that careful attention was being bestowed upon it by a gentleman unsurpassed by any member of our society in his enthusiasm for horticulture. Long may he live to enjoy it!

All of which is respectfully submitted.

J. H. WOODFORD, *Chairman.*

REPORT

OF THE

SPECIAL COMMITTEE ON WINDOW GARDENING.

BY MRS. H. L. T. WOLCOTT, SECRETARY.

At the meeting of the Society, held on the 2d of March, the following communication was read by the President: —

"The undersigned, interested in advancing a practical taste for horticulture, especially among the children of the laboring classes, desire that the Massachusetts Horticultural Society shall offer prizes for Window Gardening, and conduct all the business of advertising, exhibiting, and awarding prizes.

RUFUS ELLIS.
HENRY W. FOOTE.
C. A. BARTOL."

In response to this request, a special committee, consisting of the Standing Committee on Plants and Flowers, with Mrs. H. L. T. Wolcott, Mrs. E. M. Gill, and Mrs. C. N. S. Horner, was appointed to carry out the object sought. The first meeting of this Committee was held in the Library room, on Thursday, March 7th, at noon.

Ignorance as to the best *methods* to achieve success was the first obstacle in the path of the Committee; therefore the ladies at whose suggestion the request had been made, were asked to attend and more fully explain their plans. After a short discussion it was decided to follow the course the experience of the Society had approved, and to offer prizes and gratuities for plants grown in windows, the Society not to be in any way responsible for any expenditure of money. At an adjourned meeting, a sub-committee, consisting of Messrs. Spooner, Ross, and Hitchings, with Mrs.

Wolcott, was chosen, and to them was committed the work of preparing a list of such plants as could be grown satisfactorily in windows, especially those which would not require a large share of sunlight, and also of arranging a list of prizes to stimulate a healthful rivalry.

The second obstacle confronting the Committee was the difficulty of reaching the children to be encouraged to cultivate the plants. The third was the lesser one of obtaining plants for distribution.

To meet the second obstacle, a circular was issued to the pastor of every church in the city proper, and the outlying wards. In these circulars the co-operation of the pastor, and a lady connected with the Sunday School, was requested. An informal meeting of the Committee, on Tuesday, April 2d, was attended by about forty ladies and gentlemen, who discussed the plans quite fully. At this time generous offers of plants, suitable for the purpose, were made by H. Weld Fuller, and Henry Ross. A Schedule of prizes to be offered was published, uniform with that of the Society's other prizes, and distributed to those schools which had expressed an interest in the subject, as well as to those missionaries who were conversant with the children to be reached. During the month of June but few plants were presented for gratuities. On each Saturday in July and August, plants were offered by the children, and after a few gratuities had been awarded the interest became quite general. On September 14th the Society, through the Committee, opened the Lower Hall for a special exhibition, and a couple of hundred plants were brought for competition according to the Schedule. While the Committee were occupied in deciding on the merits of the specimens, which, to say the least, were not as thrifty as those that usually grace the tables, the criticisms of the passers by were, in a few instances, unfavorable, but a word of explanation as to the raisers was accepted pleasantly, and a Schedule, which contained a brief statement of the work, was carried away to be conned over at home.

Those who have watched this movement from the first, while cognizant of all the difficulties that lie in the way of all new departures, have been encouraged by the interest manifested, and the good results shown. Letters from several gentlemen and ladies bear testimony to the happy influences already noticed. It may here be mentioned, that the day appointed by the Committee for their final show was a fortnight earlier than the day for the

re-opening of some of the schools, and, therefore, two, at least, of our large mission schools were not represented, the pastor and teachers being absent from the city. Of the city schools, that of the church under the pastoral care of Rev. G. J. Prescott was always well represented.

The work of this Committee commenced with the idea of interesting the children of the laboring classes. We feel sure that many children of a larger growth, not belonging to this particular class, will confess to the beneficial influence. The touching spectacle of the procession of little children bearing their plants so proudly through the streets, and presenting them to the Committee, carried its blessing.

In reporting the financial condition of the treasury, with a balance on the right side, we hope to insure for another year that hearty co-operation of all friends of advancement, which will furnish a generous allowance of money.

The amount of cash received by the Committee was		$115 00
Paid for printing circulars, schedules, etc.,	14 00	
" " Advertisement in Boston Herald,	10 00	
" " Gratuities and Prizes,	81 28	
		105 28
Cash on hand,		$9 72

A list of the prizes and gratuities awarded is subjoined.

Respectfully submitted,

HENRIETTA L. T. WOLCOTT,
Secretary of the Committee.

PRIZES AND GRATUITIES AWARDED FOR WINDOW GARDENING.

JUNE 1.

Gratuity: —

Mrs. P. D. Richards, *Gymnogramme sulphurea.*

ROSE SHOW.

JUNE 19.

Gratuity: —

D. R. Beckford, four variegated Pelargoniums.

JULY 13.

CUT NATIVE FLOWERS. — First prize, best collection, to D. R. Beckford, Jr. Second prize, to E. W. Mitchell.

JULY 20.

Gratuities: —

Edward Revaleon, and Sophia Rouse, Cut Flowers, grown in a bay window.

JULY 27.

Gratuities: —

Edward Revaleon, and Sophia Rouse, Cut Flowers.

AUGUST 3.

Gratuities: —

J. Jewett, Coleus; E. W. Mitchell, Torenia; Sophia Rouse, Cut Flowers.

AUGUST 17.

Gratuities: —

Maude G. Bartlett, and George A. Mitchell, Fuchsias; W. B. Page, Carnation; Annie E. Middleton, Geranium; Mary L. Mackay, Oxalis.

AUGUST 24.

Gratuities: —

William Sweatman, and Lily M. Armstrong, Geraniums; Frank Henkle, Augustus Toop, Helen G. Mackay, W. B. Page, John J. Schwenk, and Dora F. Schwenk, Zonale Geraniums; Richard Middleton, Sweet Scented

Geranium; Minnie Wayne, and Nellie Mackay, Begonias; Robert W. Middleton, Heliotrope; S. Toop, Coleus; Dorcas Dorety, Fuchsias; Martha Page, German Ivy; G. W. Page, and Frank G. Armstrong, Mesembryanthemums; C. E. Page, Oxalis; Augustus Kendal, Carnation; Henry B. Staples, Cut Flowers.

AUGUST 31.

Gratuities: —

Nellie Benkett, and William Moore, Geraniums; Lizzie Utz, Joseph Moore, and Ella Remick, Zonale Geraniums; Mary Middleton, Alternanthera; W. H. Middleton, E. Middleton, and E. Mitchell, Begonias; Sarah Tibnam, Kate Middleton, Mary Williams, E. Page, and Anna C. Billings, Fuchsias; W. Middleton, Tradescantia; Robert Tibnam, Coleus; Alice Tibnam, and Julia Billings, Achyranthes; Mary Libby, Mesembryanthemums; Rosetta Middleton, and George Lunt, Ivy.

SEPTEMBER 7.

Gratuities: —

Addie Moore, Begonia; Stella B. Staples, Marion H. Hawkins, and Gertrude Hawkins, Pelargoniums; Henry B. Staples, Coleus and Cut Flowers.

SEPTEMBER 14.

SWEET SCENTED GERANIUM. — Richard Middleton; second, William Moore; third, George E. Armstrong.

BRONZE GERANIUM. — Annie E. Middleton; second, William Sweatman; third, E. W. Mitchell.

ZONALE GERANIUM. — Stella J. Pickett; second, F. Farley; third, Carrie Sandberg.

HYDRANGEA. — Nellie F. Meeker; second, Zillah Lucas.

HELIOTROPE. — Hattie Chater; second, William Sweatman; third, W. M. Armstrong.

BEGONIA. — Alfred Westberg; second, Esther Ottinger; third, A. A. Kennison.

COLEUS. — Charles Stearns; second, Sadie Bowman; third, Mrs. Rogers.

TRADESCANTIA. — Jeanette Ottinger; second, E. W. Mitchell.

GERMAN IVY (*Senecio*). — Philip Utz; second, Emma Ottinger; third, A. A. Kennison.

ENGLISH IVY. — First, second, and third prizes to Downer Kerosene Oil Co.

SEMPERVIVUM. — A. B. Drake.

BRIDAL ROSE (*Rubus rosæfolius*). — Third prize, E. Staples.

FERN. — Single plant, third prize, E. Staples, for *Aspidium acrostichoides.*

SWEET ALYSSUM. — Second prize, H. Staples.

Gratuities: —

Joseph Moore, Etta A. Stevens, Mary Libby, H. R. Staples, W. B. Page, Anna Schlicht, George Dwyer, and H. Staples, Zonale Geraniums.

John Schwenk, Clara E. Barron, Dora Schwenk, Sarah Dunphy, Esther Ottinger, Mamie Schlicht, —— Groesinger, Frank Dyer, Mrs. H. L. Macker, Flora Burbank, Austin A. Stevenson, Maggie Reed, John H. Mace, Emma Bense, Ella Remick, M. Dame, Frank Marsden, Emma Smith, Frank Henkle, Augustus Toop, and —— Graves, Geraniums; E. A. Mudge, and Willie J. Mudge, Heliotropes.

William Sweatman, Ruth Morriss, Emma F. Smith, Kate Middleton, S. Toop, and E. Smith, Begonias.

A. Wagner and R. Middleton, Foliage Begonias.

William Sweatman, Kate Middleton, Ellen Nugent, and E. Page, Fuchsias.

Mary S. Macker and C. E. Page, Oxalis.

Sadie Bowman, B. Dunphy, Etta F. Stearns, George Middleton, Mary Macker, C. Beeker, S. Toop, H. L. Macker, and Ella L. Stevens, Coleus.

A. E. Shepard, W. Page, Nellie L. Macker, Alice F. Duke, and Maggie Follis, German Ivies.

Addie Morriss, Emma Ottinger, S. E. T. (B. Y. M. C. A.), Frank Henkle, and George L. Libby, English Ivies.

Carrie Gubert, G. W. Page, Mrs. Rogers, Julia Ottinger, Bennie Sandberg, Frank Armstrong, and E. W. Mitchell, Mesembryanthemums.

Moses Sandberg, —— Groesinger, and Mrs. Albert Brown, Centaureas.

Theresa Morriss and F. Macker, Bouvardias.

Ella E. Barron and S. Toop, Salvias.

A. A. Kennison and Sarah Tibnam, Jerusalem Cherries (*Solanum Pseudo-Capsicum*).

John Dunlap, Sempervivum; Ella L. Stevenson, Stock; Rosetta Middleton, Box plants; H. Staples, Wild Flowers, and collection of pot plants; Nellie Macker, Oleander; Mrs. E. L. Muzzey, *Melothria pendula;* R. Petremant, Amaryllis; Jeanette Ottinger, Periwinkle; E. W. Mitchell, *Peristrophe.*

REPORT

OF THE

Committee of Arrangements,

FOR THE YEAR 1878.

The Committee of Arrangements of the Massachusetts Horticultural Society would respectfully submit the following report: —

The weekly exhibitions during the past year have been of great interest, and, in point of excellence, equal to any the Society has ever held in the past. They were fully attended, not only by members, but by large numbers of the public generally.

The Annual Rose Show, and the Exhibition of Strawberries, Cherries, and Early Vegetables, in June, were quite equal, if not superior, to any heretofore held. These also were crowded with visitors who expressed much satisfaction with the exquisite display of rare flowers, and the choice specimens of early fruits and vegetables. These exhibitions, like the weekly ones, were free.

The Annual Exhibition of the Society, in September, was everything that could be wished. Both the quantity and quality of the vegetables, fruits, plants, and flowers, were as fine as of any ever exhibited, and afforded much pleasure and satisfaction, not only to members of the Society, but to many of the public. The arrangement of the halls was in charge of sub-committees appointed from the Committees on Fruits, Flowers, and Vegetables, who performed their duties most acceptably; in fact, nothing was left undone that it was thought would make the exhibition successful; it was well advertised, and very fully noticed by the newspapers, and nothing was omitted whereby we could obtain a large attendance.

When we hear and read of the enthusiasm and financial success attending the exhibitions of the horticultural societies of other cities, we can but feel gratified, knowing as we do that the germs of most of them grew out of our own society, and that they were

formed in consequence of the stimulus given them by our exhibitions. For fifty years the Massachusetts Horticultural Society has been laboring successfully to create a love and taste for the cultivation of choice fruits, vegetables, and flowers, and, thus far, constant progress has been made in their cultivation, and our annual exhibitions have increased in interest from year to year. Not only has this interest been felt by our own members, but the public have also shared in it, as thousands of beautiful gardens throughout the country testify by the great improvement of their fruits and vegetables, and by the display of a vast number of new and choice flowers. The taste for and love of flowers, and the cultivation of choice fruits and fine vegetables, has, by the example of our Society, been extended all over the country. We have every reason to be proud of the work that has been accomplished by the Society—a work commenced and prosecuted with great vigor by our first members, many, indeed most, of whom have passed away, but the remembrance of whose unwearied perseverance is ever present to encourage and strengthen us to prosecute with zealous interest the object for which the Society was founded.

The exhibitions of the past year have fully sustained the reputation of the Society, and we have every reason to believe, if nature smiles favorably on our exertions, that this year, in which occurs our fiftieth anniversary, will be of increased interest to all who have the welfare of the Society at heart.

The record of the various meetings of the Committee would fail to be of especial interest to the members of the Society, confined as they have been to discussions relative to the best means of arranging the halls and the various contributions, perfecting the details concerning the exhibitions, and endeavoring to make them prove interesting to the members and the public at large.

CHAS. H. B. BRECK, *Chairman.*

REPORT

OF THE

COMMITTEE ON PUBLICATION AND DISCUSSION.

The work of the year appears so fully in the published TRANSACTIONS, as to make unnecessary any extended report. For the accurate and excellent digest of the discussions, as well as the supervision of all our printed reports, the society is largely indebted to our Secretary.

We are happy to report that the manuscript of the fifty years' history of the Society is now completed, and has been placed in the hands of the Committee for publication. Your Committee have now under consideration the manner and the time of publication. Although no definite plan has been decided upon, yet it may be proper to say that the volume, which will make about four hundred octavo pages, will doubtless be issued during the coming year.

The number of essays competing for prizes has been unusually small this year; hence, we shall have but little material in this form to present at our meetings for discussion. It is, therefore, the more desirable that our members, who have had so much experience in the various branches of our art, should show a readiness to contribute their observations for these discussions. Could we but bring to light the experiments and the results of our most successful cultivators, we should make additions to horticultural knowledge which would be well worthy of permanent record.

A prize of $25 has been awarded to J. W. Pierce, of West Millbury, Mass., for an Essay upon the Culture and Marketing of Apples, with special reference to the increased difficulty in the profitable production of that fruit.

Respectfully submitted by

W. C. STRONG,
A. B. MUZZEY,
E. L. STURTEVANT,
Committee on Publication and Discussion.

Report of the Secretary,

FOR THE YEAR 1878.

The work in this department is so similar in its character from year to year, that a report of it for the past year must necessarily be similar to those of previous years. The usual notes have been made of the discussions, after which they have been written out and submitted to the various speakers for revision. The reports, and other matters contained in the TRANSACTIONS, have been carefully prepared for the press, and superintended while passing through it; and I have endeavored in every way to co-operate with the Committee on Publication and Discussion in collecting and disseminating such information as would be for the advancement of horticulture. The reports of the weekly and annual exhibitions have been prepared for publication in the "Boston Evening Transcript" as heretofore. To the keeping of the former records of the Society and of the Executive Committee, there has this year been added, by vote of the Society, a record of all the awards made by the Fruit, Flower, and Vegetable Committees. Special attention has been given to systematizing the distribution of the publications of the Society, and keeping an exact record of every copy sent out, both to correspondents and immediate members, which, it is believed, will result in a more economical performance of this work. The revision of the lists of Honorary and Corresponding Members has been continued, but after the most diligent inquiry, and very extensive correspondence in every quarter where it seemed probable that information could be obtained, there are yet more than twenty Honorary and Corresponding Members of whom only the names are known. Probably much the larger part of these are now deceased, but until this is certainly known it seems hardly proper to place the star against their names. I would here repeat the request made last year to any persons who may receive our publications, to communicate information for the correction of these lists, or of the lists of the immediate members of the Society.

Quite as many specimens of fruit have been presented for name as usual, and, in the absence of the Fruit Committee, most of these have been placed in my hands. Owing to the great crop of apples, and the small crop of pears, the proportion of apples has been unusually large, and, as the number of varieties of apples grown is much larger than that of pears, and they have been less studied here than pears, the queries propounded for solution have been unusually difficult, but every exertion has been made to answer them.

The History of the Society, which was last year announced as completed to the close of the year 1874, has been continued as far as possible, until the reports for the present year of the various officers and committees are received.

The miscellaneous calls for information have not been less in number than usual, but as it is impossible to particularize them I can only say that they have in every case been answered to the best of my ability, and have, in the aggregate, occupied no inconsiderable portion of time.

ROBERT MANNING, *Secretary.*

REPORT

OF THE

LIBRARY COMMITTEE,

FOR THE YEAR 1878.

Your Committee beg to submit the following report on the condition and progress of the library during the past year:

The Society's appropriation has been expended wholly for periodicals and binding, and the income of the Stickney Fund has been used, according to the terms of the loan, in the purchase of books exclusively. A list of the books and magazines purchased and presented accompanies this report.

Although a larger sum could have been used to advantage for the purchase of periodicals, as the income of the Stickney Fund is limited to the purchase of standard works, the amount of the Society's appropriation has been found sufficient, and it is hoped that a similar appropriation will be made for the ensuing year. We would, however, add that there are a number of valuable periodicals which it would be well for the Society to have, and we trust that with returning prosperity the annual appropriations for the library will be increased.

All of the most useful works on botany and horticulture, published during the year, have been added to the library, and our sets of bound periodicals have, as far as possible, been completed by the purchase of missing volumes. Of late years considerable attention has been turned to the importance of preserving and extending American forests, already almost exterminated in many parts of the country, and to the care and study of forest trees. It is doubtful if any branch of rural improvement now occupies more generally the public mind than the science of forestry, or offers in all its branches a better field for careful study and investigation. Your Committee have endeavored to procure as many works as

possible, in all languages, bearing on this subject, and our library already possesses the most important collection of such works in this country. There are many books of this class too rare and valuable for private libraries, and your Committee have procured such works when possible, placing them within the reach of many who could not obtain them in any other way.

It is very desirable that the Society's regulation providing that a bulletin shall be posted in the Library Room, giving the titles of the new books as they are added, should be complied with, and it is hoped that within a few years, the Society will be able to publish a new Catalogue, or a supplement to the present one.

The want of additional shelf room is more seriously felt each year, and it will soon become an absolute necessity for the Society to consider the extension of the library accommodations.

In this connection, it will be well to consider the necessity of carefully preserving, in such a manner as to render them at all times accessible to the members of the Society, the numerous valuable pamphlets, and other occasional publications on rural matters which could be easily procured by gift or purchase, and which, if properly cared for, would form one of the most valuable departments of the library. Such publications your Committee have not endeavored to procure, as no provision for their care has ever been made, it having been the custom of those directly in charge of the library to dispose of such pamphlets and journals as seemed of little value to them, to other societies, on the plea of want of accommodation. It is very desirable that every journal relating to horticulture or agriculture, and every pamphlet and catalogue sent to the Society, should be carefully preserved and bound, and thus made accessible for future examination and study.

Your Committee also consider it their duty to direct the attention of the Society to the uses for which their Library Rooms are employed; uses which render them unfit places for quiet reading or study. While the propriety of leasing the Society's halls is not disputed, it is submitted that the rooms containing one of the most valuable horticultural and botanical libraries in the world, should not be turned into a general headquarters for the managers of the miscellaneous exhibitions which visit Boston, and who, by their loud conversation and passing to and fro, cause a confusion which is not in harmony with the objects of the Society, and which especially interferes with the legitimate uses of the library.

The fern case presented by Mr. Davenport had become much overcrowded by the numerous specimens added by that gentleman, and a new one has been made under his kind supervision, giving ample accommodation for future additions, besides much improving the appearance of the room. It may be of interest to add that those most capable of judging, consider this to be one of the most valuable and complete collections of North American ferns in existence, and the Society is very fortunate in possessing such a treasure.

As all the library bills will not have been paid until the close of this year, the exact amounts expended by your Committee will appear in the Report of the Treasurer.

For the Committee,

WALDO O. ROSS, *Chairman.*

LIBRARY ACCESSIONS.

Books Purchased.

Decandolle, A. et C. Monographiæ Phanerogamarum, etc. Vol. 1., Smilaceæ, Restiaceæ, Meliaceæ. 9 plates. Large 8vo. Paris: 1878.

Watson, Sereno. Bibliographical Index to North American Botany. Part. 1, Polypetalæ. 8vo. Washington: 1878.

Elwes, Henry John, F. L. S., F. Z. S. A Monograph of the Genus Lilium. Illustrated by W. H. Fitch, F. L. S. Parts 1–4. Folio. 32 colored plates. London: 1877.

Chaté, E. Fils. Le Canna. 16mo. Paris: no date.

Bradley, Richard, F. R. S. History of Succulent Plants. Small 4to. 50 plates. London: 1716.

Bentley, Robert, F. L. S., and Henry Trimen, M. B., F. L. S. Medicinal Plants. Parts 19–36, in continuation. 8vo. colored plates. London: 1877, 78.

Gray, Asa, LL. D. Synoptical Flora of North America. Gamopetalæ after Compositæ. Vol. 2. Part I. Large 8vo. New York: 1878.

Flora Danica. Fasciculus XLIX. Folio. Plates 2881–2940. Copenhagen: 1877.

Oliver, Daniel, F. R. S., F. L. S. Flora of Tropical Africa. Vol. 3. Umbelliferæ to Ebenaceæ. 8vo. London: 1877.

Baker, J. G., F. L. S. Flora of Mauritius and the Seychelles. 8vo. London: 1877.

Bentham, G. Flora Australiensis. Vols. 5, 6, and 7. Myoporineæ to Filices. 8vo. London: 1870–78.

Crépin, François. Guide du Botaniste en Belgique. 12mo. Paris: 1878.

Lavallée, Alph. Arboretum Segrezianum. Énumération des Arbres et Arbrisseaux, cultivés a Segrez. 8vo. Paris: 1877.

Gordon, George, A. L. S. The Pinetum. 2d Edition. 8vo. London: 1875.

Brown, James, LL. D. The Forester; or a Practical Treatise on the Planting, Rearing, and General Management of Forest Trees. 4th edition. Thick 8vo. 187 wood-cuts. London and Edinburgh: 1871.

Laslett, Thomas. Timber and Timber Trees, Native and Foreign. Small 8vo. 84 wood-cuts. London: 1875.

Edinburgh Botanical Society's Transactions. Vols. 1–12. 8vo. Many plates. Edinburgh: 1844–1876.

Highland and Agricultural Society's Transactions. 4th series. Vols. 1–9. 8vo. Edinburgh, 1866–77. [Continuation of the Prize Essays of the Highland Society.]

Country Gentleman. Vols. 1–14. 4to. Albany, 1853–59.

American Agriculturist. Vols. 1–8, 10. 9 vols. 8vo. 12–14, 16, 17. 5 vols. 4to. New York, 1842–58.

Gardener's Chronicle and Agricultural Gazette. 1855, '56, '57, '59. 4 vols. Folio. London.

Williamson, John. Ferns of Kentucky. Small 8vo. 66 plates, with wood-cuts. Louisville: 1878.

Smith, John, A. L. S. Historia Filicum. Small 8vo. 30 lithographic plates. London: 1875.

Robinson, John. Ferns in Their Homes and Ours. Small 8vo. 22 plates. Salem, 1878.

Waring, George E., Jr. Village Improvements and Farm Villages. 16mo. 16 wood-cuts. Boston: 1878.

Egleston, Nathaniel Hillyer. Villages and Village Life, with Hints for their Improvement. Small 8vo. New York: 1878.

Miller, Philip, F. R. S. Figures of the most Beautiful, Useful, and Uncommon Plants, described in the Gardener's Dictionary, with Descriptions, etc. 2 vols. Folio. 300 colored plates. London: 1771.

Robinson, William, F. L. S. The Parks and Gardens of Paris. 2d ed. 8vo. Many wood-cuts. London: 1878.

Pulteney, Richard, M. D., F. R. S. A General View of the Writings of Linnæus, with Memoir, etc. 2d edition. 4to. Portraits and other plates. London: 1805.

Prior, R. C. A., M. D. Popular Names of British Plants. Small 8vo. London: 1870.

Tillinghast, Isaac F. A Manual of Vegetable Plants. Thin 12mo. Factoryville, Pa.: 1878.

Wallace, Alfred R. Tropical Nature, and other Essays. Large 8vo. London: 1878.

Tanner, Henry, F. C. S. First Principles of Agriculture. 16mo. London: 1878.

Nichols, James R., M. D. Chemistry of the Farm and Sea, etc. 12mo. New York. No date. [1875?]

Thomas, John J. Annual Register of Rural Affairs. Vol. 8. 1876, 7, 8. Small 8vo. 441 wood-cuts. Albany: 1878.

United States Centennial Commission. International Exhibition, 1876. Reports and Awards. Groups VI., XXIII., XXIX., XXXVI. 8vo. Philadelphia: 1877, 78.

BOOKS AND PAMPHLETS PRESENTED.

Meehan, Thomas. The Native Flowers and Ferns of the United States. Vol. 1. Imp. 8vo. 48 colored plates. Boston: 1878. L. Prang & Co.

Vilmorin, Andrieux et Cie. Les Fleurs de Pleine Terre, etc. 3d edition. Large 12mo., nearly 1300 wood-cuts. Paris: 1870. Vilmorin, Andrieux et Cie.

Vilmorin's Atlas of Flowers. English edition of Atlas de Fleurs de Pleine Terre. Small 8vo. 1128 wood-cuts. Vilmorin, Andrieux et Cie.

——— Illustrirte Blumengartnerei. 8vo. 1235 wood-cuts. Berlin: 1873. Vilmorin, Andrieux et Cie.

Victoria Regia. Four water color paintings, with manuscript description, etc. Francis Parkman.

Hough, Franklin B. Report on Forestry; prepared under the direction of the Commissioner of Agriculture. 8vo. Washington: 1878. W. G. LeDuc, Commissioner.

Sargent, C. S. Notes on Trees and Tree Planting. 8vo. pamphlet. Boston: 1878. The Author.

Barney, E. E. Facts and Information in relation to the Catalpa Tree. 8vo. pamphlet. Dayton, Ohio: 1878.

Robinson, John. The Pine, its Life and Importance in Essex County. [From the Bulletin of the Essex Institute, July–September, 1878.] 8vo. pamphlet. The Author.

——— ———. Ferns in their Homes and Ours. Small 8vo., 22 plates. Salem: 1878. The Author.

Davenport, George E. Aspidium Spinulosum (Swartz) and its Varieties 8vo. pamphlet. [From the American Naturalist, November, 1878.] The Author.

——— ——— —. Notes on Botrychium Simplex. 4to. pamphlet. 1877. John Robinson.

List of the Native and Exotic Ferns in the Greenhouses and Grounds of J. Warren Merrill, at Cambridge, Mass. 8vo. pamphlet. Boston: 1878. J. W. Merrill.

Plans of Flower Gardens, Beds, Borders, Roseries, and Aquariums. By Contributors to the Journal of Horticulture. 8vo. 72 wood-cuts. London: no date. W. O. Ross.

Pearson, J. R. Vine Culture under Glass. 16mo., wood-cuts. London: 1867. W. O. Ross.

Atwater, Prof. W. O. Potash in Agriculture. 8vo. pamphlet. The Author.

Thomas, Flavel S., A. M., M. D., etc. Lectures on the Science of Agriculture. 8vo. pamphlet. Salem: 1876. 3 copies. Naturalist's Agency.

Sturtevant, Dr. E. Lewis. Intercultural Tillage. 8vo. pamphlet. The Author.

Ernst, A. Estudios Sobre las Deformaciones, Enfermedades, y Enemigos del Arbol de Cafe en Venezuela. 4to. pamphlet. Caracas: 1878. George E. Davenport.

Dearborn, Gen. H. A. S.; Twenty-nine Manuscript Letters to. 1816–1850. J. Coburn.

Ohio Horticultural Society; Eleventh Annual Report, 1877–78. 8vo. pamphlet. Columbus: 1878. M. B. Bateham, Secretary.

Wisconsin Horticultural Society; Transactions at Meetings, June, 1877, and February, 1878. 8vo. Madison: 1878. F. W. Case, Secretary.

New Jersey Horticultural Society; Proceedings at the Third Annual Meeting; New Brunswick, February, 1878. 8vo. pamphlet. E. Williams, Secretary.

Worcester County Horticultural Society; Transactions for 1877. 8vo. pamphlet. Worcester: 1878. E. W. Lincoln, Secretary.

Western New York Horticultural Society; Proceedings at the Twenty-third Annual Meeting, Rochester, January, 1878. 8vo. pamphlet. Rochester: 1878. P. C. Reynolds, Secretary.

Bulletin de la Société Centrale d'Horticulture du Départment de la Seine-Inferieure. Vol. 19, and Parts 1–3, of Vol. 20. 8vo. Rouen: 1877, 78. The Society.

Michigan Pomological Society; Seventh Annual Report of the Secretary, for 1877. 8vo. Lansing: 1878. C. W. Garfield, Secretary.

Pennsylvania Fruit Growers' Society; Report for 1877. 8vo. pamphlet. 5 plates. Harrisburg: 1878. 2 copies. E. B. Engle, Secretary.

Ontario Fruit Growers' Association; Report for 1877, and Report of the Entomological Society for 1877. 8vo. pamphlet. Toronto: 1878. D. W. Beadle, Secretary.

Bussey Institution Bulletin. Vol. 2, Part 3. 8vo. pamphlet. Boston: 1878. C. S. Sargent.

New York Department of Public Parks; Third Annual Report of the Board of Commissioners. May 1, 1872, to December 31, 1873. F. Becker, Jr.

Fairmount Park Commissioners' Annual Report for 1877. 8vo. Plates. Philadelphia: 1878. The Commissioners.

Chicago South Park Commissioners' Report to the Board of County Commissioners of Cook County, Illinois, from December 1st, 1876, to December 1st, 1877. 8vo. pamphlet. Photographs. Chicago: 1878. 2 copies. H. W. Harmon, Secretary.

Massachusetts Society for Promoting Agriculture; Transactions, New Series, Vol. I. 8vo. Boston: 1858.

Rhode Island Society for the Encouragement of Domestic Industry; Transactions, 1858–71. 14 pamphlets. 8vo. Providence: 1859–1872. J. S. Pitman, Secretary.

Essex Agricultural Society; Transactions for 1877. 8vo. pamphlet. Salem: 1877. 2 copies. B. P. Ware, President.

Bristol County Agricultural Society; Report for 1877. 8vo. pamphlet. Taunton: 1878. D. L. Mitchell, Secretary.

Hingham Agricultural and Horticultural Society; Transactions for 1877. 8vo. pamphlet. 1878.

Iowa State Agricultural Society; Reports of the Secretary for 1876 and 1877. 2 vols. 8vo. Des Moines: 1878. J. R. Shaffer, Secretary.

New Hampshire Board of Agriculture; Reports, Vols. 4, 5, and 6. 3 vols. 8vo. Concord: 1874–76. Centennial Papers. One Hundred Years' Progress. and Reports and Addresses relative to the Centennial Exhibition, 1876. 8vo. pamphlet. Wood-cuts. Concord: 1877. James O. Adams, Secretary.

Vermont Board of Agriculture; Fourth Report for the year 1877, and Eighth Annual Report of the Secretary of the Vermont Dairymen's Association. 8vo. Montpelier: 1877. Henry M. Seeley, Secretary.

Massachusetts Board of Agriculture; Twenty-fifth Annual Report of the Secretary, for 1877–78, with Index to the volumes from 1853 to 1877. Boston: 1878. C. L. Flint, Secretary.

Connecticut Board of Agriculture; Eleventh Report of the Secretary, 1877–78. 8vo. Hartford: 1878. T. S. Gold, Secretary.

Connecticut Agricultural Experiment Station; First Annual Report, 1876. 8vo. pamphlet. Hartford: 1877. Prof. W. O. Atwater.

Pennsylvania Board of Agriculture; First Annual Report, for the year 1877. 8vo. plates. Harrisburg: 1878. Thomas J. Edge, Secretary.

North Carolina Commissioner of Agriculture; Fourth Quarterly Report, April 16, 1878. 8vo. pamphlet. Raleigh: 1878. L. L. Polk, Commissioner.

Report on the General Condition of the Agricultural Interests of North Carolina. From returns made to the Department of Agriculture, March, 1878. 8vo. pamphlet. L. L. Polk, Commissioner.

Sugar Beet, Experiments with, in North Carolina. Report by Albert R. Ledoux, Ph. D., Chemist to the Department of Agriculture, etc. 8vo. pamphlet. Raleigh: 1878. L. L. Polk, Commissioner.

Analysis and Valuation of Fertilizers for 1877 and 1878; reported by Dr. Albert R. Ledoux. 8vo. pamphlet. Raleigh: 1878. L. L. Polk, Commissioner.

Georgia Commissioner of Agriculture; Fourth and Fifth Annual Reports for 1877. 2 pamphlets. 8vo. Atlanta: 1878. Thomas P. Janes, Commissioner.

Result of the Soil Test of Fertilizers for the year 1877; conducted under the direction of the Commissioner of Agriculture of the State of Georgia: also, Analyses of Fertilizers sold in Georgia. 8vo. pamphlet. Atlanta: 1878. T. P. Janes, Commissioner.

The Farmer's Scientific Manual; prepared under the direction of Thomas P. Janes, Commissioner of Agriculture of the State of Georgia. 8vo. 29 wood-cuts. Atlanta: 1878. The Commissioner.

Janes, T. P. A Manual of Georgia, for use of Capitalists and Immigrants. 8vo. pamphlet. Atlanta: 1878. The Author.

Michigan Board of Agriculture; Sixteenth Annual Report of the Secretary, for 1877. 8vo. Lansing: 1878. R. G. Baird, Secretary.

Indiana Board of Agriculture; Twenty-Seventh Annual Report, for 1877. 8vo. Indianapolis: 1878. Alex. Heron, Secretary.

Illinois Department of Agriculture; Transactions for 1876. Vol. 6, New Series. 8vo. Springfield: 1878. S. D. Fisher, Secretary.

Missouri Board of Agriculture; 1st, 2d, 3d, 4th, 5th, 6th, 8th, 10th, and 11th Annual Reports, for 1865, '66, '67, '68, '69, '70, '72, '74, and '75. 9 vols. 8vo. Jefferson City · 1867–1876. Also, 1st, 2d, and 10th Reports in German, for 1872, '73, and '74. 3 thick pamphlets. 8vo. Jefferson City: 1872–75. Isidor Bush.

Kansas Board of Agriculture; Fifth Annual Report, 1876. 8vo. Maps and diagrams. Topeka: 1877. Alfred Gray, Secretary.

Massachusetts Agricultural College; Fifteenth Annual Report. 8vo. pamphlet. Boston: 1878. C. L. Flint, Secretary State Board of Agriculture.

Michigan Agricultural College; Twenty-First Annual Catalogue, for 1877. 8vo. pamphlet. Lansing: 1877.

American Veterinary College, No. 141 West Fifty-Fourth Street, New York; Fourth Annual Announcement, Session 1878–79. 8vo. pamphlet. New York: 1878.

Cornell University Register and Catalogue, 1877–78. Small 8vo. pamphlet. Ithaca: 1878. W. R. Lazenby.

Louisiana State University and Agricultural and Mechanical College; Report of the Board of Supervisors, Session 1877–78. 8vo. pamphlet. New Orleans: 1878. D. F. Boyd, President of the Faculty.

Woodruff Scientific Expedition Around the World; Programme. 8vo. pamphlet.

Boston Society of Natural History; Memoirs. Vol. 2, Part 4, No. 6. 4to. pamphlet. Proceedings. Vol. 19. Part 2. 8vo. pamphlet. The Society.

Massachusetts Board of Health; Eighth Annual Report for 1876. 8vo. Boston: 1877.

American Antiquarian Society; Proceedings, Nos. 70 and 71. 2 pamphlets. 8vo. Worcester: 1878. The Society.

Missouri Board of Immigration; First Report, for 1865 and 1866. With the First Report of the Commissioners of Statistics for 1866. 8vo. Jefferson City: 1867. Also, duplicate of the latter. Thick, 8vo. pamphlet. Jefferson City: 1866. Isidor Bush.

Missouri Geological Survey, 1855–71, 1872, 1873–74. 3 vols. 8vo. Maps and plates. Jefferson City: 1873–4. Also, two large Atlases accompanying. Isidor Bush.

Periodicals Taken.

English. — Gardeners' Chronicle.
Gardener's Magazine.
Journal of Horticulture and Cottage Gardener.
The Garden.
Curtis' Botanical Magazine.
Floral Magazine.
Florist and Pomologist.
Floral World.
Journal of the Linnean Society.

Journal of Botany.
Country Gentleman's Magazine.
Journal of the Royal Agricultural Society.
Journal of Forestry.
Field and Forest.
FRENCH. — Revue Horticole.
Revue des Eaux et Forêts.
BELGIAN. — Illustration Horticole.
Flore des Serres.
Belgique Horticole.
GERMAN. — Botanische Zeitung.
AMERICAN. — Country Gentleman.
American Farmer.

PERIODICALS PRESENTED.

New England Farmer.
Massachusetts Ploughman.
American Cultivator.
Scientific Farmer.
American Agriculturist.
Gardener's Monthly.
Vick's Illustrated Monthly Magazine.
Bulletino della R. Società Toscana di Orticultura.
Southern California Horticulturist.
American Garden.
American Rural Home.
Maine Farmer.
Prairie Farmer.
Maryland Farmer.
Semi-Tropical.
Western Agriculturist.
Bulletin of the Essex Institute.
Bulletin of the Torrey Botanical Club.
Botanical Gazette.
New York Weekly Tribune.
New York Semi-Weekly Times.
Rhode Island Press.
Boston Evening Transcript.
Boston Daily Globe.
Daily Evening Traveller.
Boston Morning Journal.
Boston Daily Advertiser.
The Nursery.
The Cottage Hearth.
Familiar Science and Fancier's Journal.

TREASURER'S REPORT,

FOR THE YEAR 1878.

ITEMS OF INCOME.

Balance of Cash on hand,	$425 93
Received for Rent of Stores,	8,185 59
" " " " Halls,	6,765 68
" " Admissions and Assessments,	658 00
" from William Gray, Jr., to pay Prizes,	80 00
" Interest on Bonds, C. B. & Q. R. R.,	105 00
Gross Receipts of Annual Exhibition,	229 50
Received from estate of B. V. French,	2,511 13
" " Mount Auburn Cemetery,	1,679 68
	$20,640 51

ITEMS OF EXPENDITURE.

Salaries,		$3,525 00
Library accessions (Stickney fund),		700 22
" " Periodicals and Binding,		218 42
Heating and Water (less paid by tenants),		281 22
Printing,		839 42
Stationery and Postage,		158 31
Gas,		945 07
Repairs on Building,		125 29
Furniture, and Repairs,		74 82
Fixtures, " "		80 46
Taxes,		2,909 51
Interest,		3,691 42
Testimonial to Ex-President Parkman,		100 00
Portrait of President Gray,		200 00
Expenses of Annual Exhibition,		197 18
Amount carried forward,		$14,046 34

Amounts brought forward,	$14,046 34	$20,640 51
Entertainment of Committee of Arrangements,	226 30	
Expended by the Committee on Publication and Discussion,	95 00	
Legal Services,	105 00	
Labor and Incidentals,	597 37	
Balance of Prizes for 1877,	1,251 89	
Deposited to pay Prizes of 1878,	4,000 00	
Balance carried to new account,	318 61	
		$20,640 51

BOSTON, January 15, 1879.

E. W. BUSWELL, *Treasurer:*

Sir, — We have examined the books and accounts of the Society as rendered by you, and find them correct and entirely satisfactory.

C. O. WHITMORE,
H. H. HUNNEWELL,
B. P. CHENEY,
} *Finance Committee.*

ASSETS AND LIABILITIES.

ASSETS.

Real Estate, Furniture, and Exhibition Ware, costing		$256,585 56
Library, last year,	$17,148 81	
Added this year,	918 64	
		18,067 45
Bonds of C. B. & Q. R. R., par value,		1,500 00
Total,		$276,153 01

LIABILITIES.

Mortgage debt at 5½ per cent., payable September, 1883,	$60,000 00	
Loan without interest, payable to Harvard College in 1899,	12,000 00	
Note to Market National Bank,	12,000 00	
		$84,000 00
Balance of assets over liabilities,		$192,153 01

By last report our members numbered . . .				953
Viz: Life members, . .		581		
Added by election, .	3			
" " commutation,	1			
	—	4		
		585		
Deceased, . .		8		
			577	
Annual members, . .		372		
Added, ...		9		
		381		
Commuted, ...	1			
Deceased, ...	6			
Withdrawn, . . .	1			
Discontinued for non-payment of dues, ...	50			
	—	58		
			323	
				900

Income from the above:	
3 Life, ...	$90 00
1 Commutation, . . .	20 00
9 Annual, ...	90 00
229 Assessments, . . .	458 00
	$658 00

The depression in business which has so long and universally pervaded the community, has taken us in its course, and admonished us to observe the strictest economy in all our expenditures. The warning has not passed unheeded. Our few sources of income have been watched and nursed with due care and consideration, letting pass no opportunity to add in any measure to our resources. The stores have been kept up to the full standard of rent, consistent with occupancy, and are now all tenanted except one; that, I hope, soon will be. The halls have been in fair demand at reduced rates; Mount Auburn Cemetery has yielded little more than last year, and membership account less.

With these probabilities in view, your Committees recommended

smaller appropriations, salaries were reduced, and the strictest economy has been practised in carrying on our work. Nevertheless, but for the amount received from the French estate, we must have added to our indebtedness. In view of this condition, salaries and appropriations have been still further reduced, in the hope of being able to make expenditures on the building which cannot well be longer delayed. The whole interior needs rejuvenation, and the wood, iron, and brick work of the roof and exterior need painting to prevent actual loss. The necessity of more space for the library demands early attention, as a subject which must necessarily involve expense at no distant day. A well prepared history of the Society, from its beginning, awaits publication. Such interest is manifested in the work as to warrant the belief that a small edition may be printed and sold, without material detriment to our finances.

In this connection, I am reminded of the Semi-Centennial year of our existence. I wish we were in such circumstances as would enable us to celebrate the event in a manner commensurate with its great importance, and in the spirit of the age; but when material and absolute interests are jeopardized, it behooves us to act with care, and leave the expense to be met by the public spirit of individual members.

The decrease of our membership calls for careful consideration. If, as intimated in my last report, the cause is to be found in the facility with which non-members may avail themselves of the benefit accruing to members, the remedy is plainly before you. I would suggest an alteration in our By-Laws which shall make prizes available to members only, as of old time. Our library, rich in horticultural lore, is, and always has been, free for consultation here, while members may withdraw books under the rules. To me this seems fair and generous to the public.

Respectfully submitted,

E. W. BUSWELL, *Treasurer.*

JANUARY 18, 1879.

Dr. *Massachusetts Horticultural Society, in account with the Proprietors of the Cemetery of Mt. Auburn.* **Cr.**

For Sales and Improvements within the Cemetery for the year ending Dec. 31, 1878.

Cost of filling up and improving land at Mt. Auburn, for the year ending December 31, 1878, the Massachusetts Horticultural Society being charged with their proportion of the same:			By Sales in January,	$850 00
Grading Stone Farm,	$431 44		" " " February,	172 07
" Vernonin Path,	45 94		" " " March,	1,487 58
" Fountain Avenue,	1,162 56		" " " April,	2,110 00
			" " " May,	614 00
			" " " June,	472 00
			" " " July,	478 00
			" " " August,	265 00
			" " " September,	189 00
			" " " October,	620 00
			" " " November,	285 00
			" " " December,	1,810 00
			" Net amount of receipts from Receiving Tomb,	430 00
	$1,639 94			$9,782 65
One quarter of		$409 98	Less paid for Grave in Public Lot, repurchased,	24 00
				$9,758 65
Balance due Massachusetts Horticultural Society,		$1,679 68	Deduct for Annual Expenses,	1,400 00
			Mass. Horticultural Society, one-fourth part of	$8,358 65
		$2,089 66		$2,089 66

E. & O. E.

H. B. MACKINTOSH, *Treasurer.*

BOSTON, December 31, 1878.

MASSACHUSETTS HORTICULTURAL SOCIETY,

To the Proprietors of the Cemetery of Mount Auburn, *Dr.*

For one-fourth part of the following expenditures for grading lands during 1878:

Stone Farm.		
137¼ days, men,	$240 19	
63¾ " man and horse,	191 25	
		$431 44
Vernonin Path.		
8½ days, men,	14 44	
10½ " man and horse,	31 50	
		45 94
Fountain Avenue.		
409¾ days, men,	717 06	
148½ " man and horse,	445 50	
		1,162 56
		$1,639 94
One-fourth part,		$409 98

MOUNT AUBURN, Dec. 31, 1878. J. W. LOVERING, *Supt.*

I certify the foregoing to be a true copy of accounts of improvements for the year 1878, rendered by the Superintendent.

H. B. MACKINTOSH, *Treasurer.*

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1879.

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Vice-Presidents.

CHARLES O. WHITMORE, of Boston.
H. WELD FULLER, of Boston.
CHARLES H. B. BRECK, of Brighton.
JOHN C. HOVEY, of Cambridge.

Treasurer.

EDWIN W. BUSWELL, of Boston.

Secretary.

ROBERT MANNING, of Salem.*

Recording Secretary.

ROBERT MANNING, of Salem.

Professor of Botany and Vegetable Physiology.

JOHN ROBINSON, of Salem.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Standing Committees:

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THE PRESIDENT, WILLIAM GRAY, JR., CHAIRMAN.
THE EX-PRESIDENTS, MARSHALL P. WILDER, CHARLES M. HOVEY, JAMES F. C. HYDE, WILLIAM C. STRONG, FRANCIS PARKMAN; CHAIRMAN OF FINANCE COMMITTEE, C. O. WHITMORE; FEARING BURR, A. T. PERKINS, HERVEY DAVIS, F. L. AMES.

* Communications for the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, Boston.

Finance.

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H. HOLLIS HUNNEWELL, BENJAMIN P. CHENEY.

Publication and Discussion.

WILLIAM C. STRONG, CHAIRMAN.
A. B. MUZZEY, E. LEWIS STURTEVANT.

Establishing Prizes.

CHAIRMAN OF COMMITTEE ON FRUITS, CHAIRMAN.
CHAIRMEN OF COMMITTEES ON FLOWERS, VEGETABLES, AND GARDENS.
C. M. ATKINSON, P. BROWN HOVEY, AND THE CHAIRMAN OF THE FINANCE COMMITTEE.

Library.

WILLIAM E. ENDICOTT, CHAIRMAN.
HENRY P. WALCOTT, FRANCIS H. APPLETON,
J. D. W. FRENCH, ROBERT MANNING.
THE PROFESSOR OF BOTANY AND HORTICULTURAL PHYSIOLOGY.
THE PROFESSOR OF ENTOMOLOGY.

Gardens.

JOSEPH H. WOODFORD, CHAIRMAN.
CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, AND VEGETABLES.
GEORGE S. HARWOOD, HENRY ROSS, JOHN G. BARKER.

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CHARLES N. BRACKETT, CHAIRMAN.

JOSIAH CROSBY,	JOHN FILLEBROWN,	SAMUEL HARTWELL,
WALTER RUSSELL,	GEORGE W. PIERCE,	CHARLES E. GRANT.

Committee of Arrangements.

CHARLES H. B. BRECK, CHAIRMAN.
CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, VEGETABLES, AND GARDENS.

GEORGE W. PIERCE,	JOHN C. HOVEY,	M. H. MERRIAM,
GEORGE HILL,	C. M. ATKINSON,	E. W. WOOD,
HERVEY DAVIS,		EDWIN A. HALL.

HONORARY MEMBERS.

A * denotes the member deceased.

*Benjamin Abbott, LL. D., Exeter, N. H.
*John Abbott, Brunswick, Me.
*Hon. John Quincy Adams, LL. D., late President of the United States.
*Prof. Louis Agassiz, Cambridge.
*William T. Aiton, late Curator of the Royal Gardens, Kew.
Thomas Allen, Ex-President of the St. Louis Horticultural Society, St. Louis, Mo., and Pittsfield, Mass.
*Hon. Samuel Appleton, Boston.
*Hon. James Arnold, New Bedford.
*Edward Nathaniel Bancroft, M. D., late President of the Horticultural and Agricultural Society of Jamaica.
*Hon. Philip P. Barbour, Virginia.
*Robert Barclay, Bury Hill, Dorking, Surrey, England.
*James Beekman, New York.
*L'Abbé Berlèse, Paris.
*Nicholas Biddle, Philadelphia.
*Dr. Jacob Bigelow, Boston.
*Mrs. Bigelow, Medford.
*Le Chevalier Soulange Bodin, late Secrétaire-Général de la Société d'Horticulture de Paris.
Hon. George S. Boutwell, Groton.
*Josiah Bradlee, Boston.
*Hon. George N. Briggs, Pittsfield.
*Hon. James Buchanan, late President of the United States.
*Jesse Buel, late President of the Albany Horticultural Society.
*Hon. Edmund Burke, late Commissioner of Patents, Washington, D. C.
*Augustin Pyramus de Candolle, Geneva.
Hon. Horace Capron, Ex-U. S. Commissioner of Agriculture, Washington, D. C.
*Isaac Chauncey, U. S. Navy, Brooklyn, N. Y.
*Lewis Clapier, Philadelphia.
*Hon. Henry Clay, Kentucky.
H. W. S. Cleveland, Chicago, Ill.
*Admiral Sir Isaac Coffin, Bart., England.
*Zaccheus Collins, late President of the Pennsylvania Horticultural Society, Philadelphia.
*Roswell L. Colt, Paterson, N. J.
Caleb Cope, Ex-President of the Pennsylvania Horticultural Society, Philadelphia.

*William Coxe, Burlington, N. J.
*John P. Cushing, Watertown.
*Charles W. Dabney, late U. S. Consul, Fayal.
*Hon. John Davis, LL. D., Boston.
*Sir Humphry Davy, London.
*Gen. H. A. S. Dearborn, Roxbury.
*James Dickson, late Vice-President of the London Horticultural Society.
*Mrs. Dorothy Dix, Boston.
*Capt. Jesse D. Elliot, U. S. Navy.
*Hon. Stephen Elliot, LL. D., Charleston, S. C.
*Allyn Charles Evanson, St. John, N. B., late Secretary of the King's County Agricultural Society.
*Hon. Edward Everett, LL. D., Boston.
*Hon. Horace Everett, Vermont.
*F. Falderman, late Curator of the Imperial Botanic Garden, St. Petersburg.
*Hon. Millard Fillmore, late President of the United States.
*Dr. F. E. Fischer, late Professor of Botany at the Imperial Garden, St. Petersburg.
*Hon. Theodore Frelinghuysen, late President of the American Agricultural Society.
*Joseph Gales, Jr., late Vice-President of the Horticultural Society, Washington, D. C.
*George Gibbs, New York.
*Stephen Girard, Philadelphia.
*Hon. Robert H. Goldsborough, Talbot County, Maryland.
*Ephraim Goodale, South Orrington, Maine.
*Mrs. Rebecca Gore, Waltham.
*Hon. John Greig, late President of the Domestic Horticultural Society, Canandaigua, N. Y.
*Mrs. Mary Griffith, Charlies Hope, N. J.
*Gen. William Henry Harrison, late President of the United States.
*S. P. Hildreth, M. D., Marietta, O.
*Thomas Hopkirk, late President of the Glasgow Horticultural Society.
*David Hosack, M. D., late President of the New York Horticultural Society.
*Louis Hunt, Huntsburg, O.
*Joseph R. Ingersoll, late President of the Pennsylvania Horticultural Society, Philadelphia.
*Gen. Andrew Jackson, late President of the United States.
*Mrs. Martha Johonnot, Salem.
*Jared Potter Kirtland, LL. D., East Rockport, O.
*Thomas Andrew Knight, late President of the London Horticultural Society.
*Gen. La Fayette, La Grange, France.
Le Comte de Lasteyrie, Vice-President of the Horticultural Society of Paris.
A. H. Latour, M. P., 1396 St. Catherine Street, Montreal, Canada.
*Baron Justus Liebig, Giessen, Germany.

*Prof. John Lindley, late Secretary of the London Horticultural Society.
Franklin Litchfield, U. S. Consul at Puerto Cabello.
*Joshua Longstreth, Philadelphia.
*Nicholas Longworth, Cincinnati.
*Jacob Lorillard, late President of the New York Horticultural Society.
*John C. Loudon, London.
John A. Lowell, Boston.
*Baron H. Carol Von Ludwig, Cape Town, Cape of Good Hope.
*Hon. Theodore Lyman, Brookline.
Col. Theodore Lyman, Brookline.
*Hon. James Madison, late President of the United States.
*Mrs. Charlotte Marryatt, Wimbledon, near London.
Joseph Maxwell, Rio Janeiro.
D. Smith McCauley, U. S. Consul-General, Tripoli.
*Hon. Isaac McKim, late President of the Horticultural Society of Maryland.
Rev. James H. Means, Dorchester, Mass.
*James Mease, M. D., Philadelphia.
*Lewis John Mentens, Brussels.
*Hon. Charles F. Mercer, Virginia.
*François André Michaux, Paris.
Donald G. Mitchell, New Haven, Ct.
*Samuel L. Mitchill, LL. D., New York.
*Hon. James Monroe, late President of the United States.
*A. N. Morin, Montreal, Canada.
*Théodore Mosselmann, Antwerp, Belgium.
*Alfred Munson, M. D., late President of the New Haven Horticultural Society.
Baron Ottenfels, Austrian Minister to the Ottoman Porte.
John Palmer, Calcutta.
*Hon. Joel Parker, LL. D., Cambridge.
Samuel B. Parsons, Flushing, N. Y.
*Hon. Thomas H. Perkins, Brookline.
*A. Poiteau, late Professor in the Institut Horticole de Fromont.
*Hon. James K. Polk, late President of the United States.
*John Hare Powel, Powelton, Pa.
*Henry Pratt, Philadelphia.
*William Prince, Flushing, N. Y.
*Rev. George Putnam, D. D., Roxbury.
*Joel Rathbone, late President of the Albany and Rensselaer Horticultural Society, Albany.
*Archibald John, Earl of Roseberry, late President of the Caledonian Horticultural Society.
*Joseph Sabine, late Secretary of the London Horticultural Society.
*Don Ramon de la Sagra, Cuba.
Henry Winthrop Sargent, Fishkill, N. Y.
*Sir Walter Scott.
*William Shaw, New York.

*John Shepherd, late Curator of the Botanic Garden, Liverpool.
*John S. Skinner, Baltimore.
George W. Smith, Boston.
*Stephen H. Smith, late President of the Rhode Island Horticultural Society.
*Judge E. B. Strong, Rochester.
*Hon. Charles Sumner, Boston.
*Gen. Zachary Taylor, late President of the United States.
*Hon. John Taliaferro, Virginia.
*Gen. James Tallmadge, late President of the American Institute, New York.
*James Thacher, M. D., Plymouth.
John J. Thomas, Union Springs, N. Y.
*James W. Thompson, M. D., Wilmington, Del.
*Grant Thorburn, New York.
*M. Du Petit Thouars, Paris, late President of the Institut Horticole de Fromont.
*Le Vicomte Hericart de Thury, late President of the Horticultural Society of Paris.
*Mons. Tougard, late President of the Horticultural Society of Rouen, France.
*Gen. Nathan Towson, late President of the Horticultural Society, Washington, D. C.
*Col. W. Towson, late President of the Agricultural Society, Washington, D. C.
*Hon. John Tyler, late President of the United States.
*Rev. Joseph Tyso, Wallingford, England.
*Hon. Martin Van Buren, late President of the United States.
*Federal Vanderburg, M. D., New York.
*Jean Baptiste Van Mons, M. D., Brussels.
*Gen. Stephen Van Rensselaer, Albany, N. Y.
Joseph R. Van Zandt, Albany, N. Y.
*Benjamin Vaughan, Hallowell, Me.
*Petty Vaughan, London.
*Rev. N. Villeneuve, Montreal.
*Pierre Phillippe André Vilmorin, Paris.
*James Wadsworth, Geneseo, N. Y.
*Nathaniel Wallich, M. D., late Curator of the Botanic Garden, Calcutta.
*Malthus A. Ward, late Professor in Franklin College, Athens, Ga.
*Hon. Daniel Webster, Marshfield.
*Hon. John Welles, Boston.
*Jeremiah Wilkinson, Cumberland, R. I.
Hon. Robert C. Winthrop, Boston.
*Frederick Wolcott, Litchfield, Conn.
*Lawrence Young, late President of the Kentucky Horticultural Society Louisville.
*Ashton Yates, Liverpool.

CORRESPONDING MEMBERS.

A * denotes the members deceased.

*John Adlum, Georgetown, D. C.
*Mons. Alfroy, Lieusaint, France.
A. B. Allen, Tom's River, N. J.
James T. Allan, Ex-President of the Nebraska State Horticultural Society, Omaha, Neb.
Rev. Thomas D. Anderson, New York.
*Thomas Appleton, late U. S. Consul, Leghorn.
Don Francisco Aguilar, Maldonado, Banda Oriental del Uruguay.
*Thomas Aspinwall late U. S. Consul at London, Brookline.
P. M. Augur, State Pomologist, Middlefield, Conn.
*Isaac Cox Barnet, late U. S. Consul, Paris.
Patrick Barry, Chairman of the General Fruit Committee of the American Pomological Society, Rochester, N. Y.
*Augustine Baumann, Bolwiller, Alsace.
*Eugéne Achille Baumann, Bolwiller, Alsace.
*Joseph Bernard Baumann, Bolwiller, Alsace.
Napoleon Baumann, Bolwiller, Alsace.
D. W. Beadle, St. Catherine's, Canada West.
Prof. W. J. Beal, Lansing, Michigan.
*Noel J. Becar, Brooklyn, N. Y.
*Edward Beck, Worton College, Isleworth, near London.
Rev. Henry Ward Beecher, Peekskill, N. Y.
Louis Édouard Berckmans, Rome, Ga.
Prosper J. Berckmans, Augusta, Ga.
*Alexandre Bivort, late Secrétaire Général de la Société Van Mons, Fleurus, Belgique.
*Mons. Tripet Le Blanc, Paris.
*Charles D. Bragdon, Pulaski, Oswego Co., N. Y.
*William D. Brinckle, M. D., Philadelphia.
*John W. Brown, Fort Gaines, Ga.
Dr. Nehemiah Brush, East Florida.
Arthur Bryant, Sr., Ex-President of the Illinois State Horticultural Society, Princeton., Ill.
Robert Buist, Philadelphia.
*E. W. Bull, Hartford, Conn.
Rev. Robert Burnet, President of the Ontario Fruit Growers' Association, Hamilton, Canada West.
Alexander Burton, Cadiz.

ISIDOR BUSH, Bushberg, Jefferson Co., Mo.
WILLIAM BULL, Chelsea, England.
GEORGE W. CAMPBELL, Delaware, Ohio.
*FRANCIS G. CARNES, New York.
*ROBERT CARR, Philadelphia.
*JAMES COLVILL, Chelsea, England.
*REV. HENRY COLMAN, Boston.
BENJAMIN E. COTTING, M. D. Boston.
*S. L. DANA, M. D., Lowell.
J. DECAISNE, Professeur de Culture au Muséum d' Histoire Naturelle, Jardin des Plantes, Paris.
*JAMES DEERING, Portland, Me.
*H. F. DICKEHUT.
*SIR C. WENTWORTH DILKE, Bart., London.
*HON. ALLEN W. DODGE, Hamilton, Mass.
REV. H. HONYWOOD D'OMBRAIN, Westwell Vicarage, Ashford, Kent, England.
CHARLES DOWNING, Newburg, N. Y.
PARKER EARLE, Cobden, Ill.
*F. R. ELLIOTT, late Secretary of the American Pomological Society, Cleveland, Ohio.
*HON. HENRY L. ELLSWORTH, late Commissioner of Patents, Washington, D. C.
GEORGE ELLWANGER, Rochester, N. Y.
GEORGE B. EMERSON, LL. D., Winthrop.
*EBENEZER EMMONS, M. D., Williamstown.
*A. H. ERNST, Cincinnati.
*NATHANIEL FELLOWS, Cuba.
*HENRY J. FINN, Newport, R. I.
*W. C. FLAGG, late Secretary of the American Pomological Society, Moro, Ill.
*MICHAEL FLOY, late Vice-President of the New York Horticultural Society, New York City.
*JOHN FOX, Washington, D. C.
*HON. RUSSELL FREEMAN, Sandwich.
ANDREW S. FULLER, Ridgewood, N. J.
HENRY WELD FULLER, Roxbury.
R. W. FURNAS, President of the Nebraska State Horticultural Society, Brownville, Neb.
*AUGUSTUS GANDE, late President of the Horticultural Society, Department of Sarthe, France.
*ROBERT H. GARDINER, Gardiner, Me.
*BENJAMIN GARDNER, late U. S. Consul at Palermo.
*CAPT. JAMES P. GERRY, U. S. Navy.
*ABRAHAM P. GIBSON, late U. S. Consul at St. Petersburg.
*R. GLENDENNING, Chiswick, near London.
PROF. GEORGE L. GOODALE, Cambridge.
PROF. ASA GRAY, Cambridge.
O. B. HADWEN, Ex-President of the Worcester County Horticultural Society, Worcester.

*Charles Henry Hall, New York.
*Abraham Halsey, New York.
Dr. Charles C. Hamilton, President of the Fruit Growers' Association and International Show Society of Nova Scotia, Cornwallis.
*Rev. Thaddeus Mason Harris, D. D., Dorchester.
*Thaddeus William Harris, M. D., Cambridge.
*John Hay, late Architect of the Caledonian Horticultural Society.
*Bernard Henry, Philadelphia.
Shirley Hibberd, Editor of the Gardener's Magazine, London.
*J. J. Hitchcock, Baltimore.
Robert Hogg, LL. D., Editor of the Journal of Horticulture, London.
*Thomas Hogg, New York.
Thomas Hogg, New York.
J. C. Holding, Ex-Treasurer and Secretary of the Cape of Good Hope Agricultural Society, Cape Town, Africa.
Rev. S. Reynolds Hole, Caunton Manor, Newark, Nottinghamshire, England.
Fisher Holmes, Sheffield, England.
Sir Joseph Hooker, K. C. S. I., Director of the Royal Botanic Garden, Kew, England.
Josiah Hoopes, West Chester, Pa.
Prof. E. N Horsford, Cambridge.
*Sanford Howard, Chicago, Ill.
Dr. William M. Howsley, President of the Kansas State Horticultural Society, Leavenworth.
*Isaac Hunter, Baltimore.
*Isaac Hurd, Cincinnati, Ohio.
George Husmann, Sedalia, Pettis County, Mo.
Thomas P. James, Cambridge.
Edward Jarvis, M. D., Dorchester.
William J. Johnson, M. D., Fort Gaines, Ga.
Samuel Kneeland, M. D., Boston.
*Mons. Laffay, St. Cloud, near Paris, France.
David Landreth, Ex-Corresponding Secretary of the Pennsylvania Horticultural Society, Bristol, Pa.
C. C. Langdon, Mobile, Alabama.
*Dr. William LeBaron, late State Entomologist, Geneva, Ill.
G. F. B. Leighton, President of the Norfolk Horticultural and Pomological Society, Norfolk, Va.
*E. S. H. Leonard, M. D., Providence.
*André Leroy, Author of the Dictionnaire de Pomologie, Angers, France.
J. Linden, Ghent, Belgium.
Hon. George Lunt, Boston.
*F. W. Macondray, San Francisco, Cal.
*James J. Mapes, LL. D., Newark, N. J.
*A. Mas, late President of the Horticultural Society, Bourg-en-Bresse, France.
Dr. Maxwell T. Masters, Editor of the Gardener's Chronicle, London.

*James Maury, late U. S. Consul, Liverpool.
T. C. Maxwell, Geneva, N. Y.
*James McNab, late Curator of the Botanic Garden, Edinburgh, Scotland.
Thomas Meehan, Editor of the Gardener's Monthly, Germantown, Pa.
*Allen Melville, New York.
John Miller, M. D., Secretary of the Horticultural and Agricultural Society of Jamaica.
*Stephen Mills, Flushing, N. Y.
*Charles M'Intosh, Dalkeith Palace, near Edinburgh.
J. E. Mitchell, Philadelphia.
*William S. M'Lean, New York.
Guiseppe Monarchini, M. D., Canea, Isle of Candia.
Édouard Morren, Editor of the Belgique Horticole, Liége, Belgium.
*Horatio Newhall, M. D., Galena, Ill.
*David W. Offley, U. S. Agent, Smyrna.
James Ombrosi, U. S. Consul, Florence.
*John J. Palmer, New York.
*Victor Paquet, Paris.
*John W. Parker, late U. S. Consul, Amsterdam.
*Andrew Parmentier, Brooklyn, N. Y.
William Paul, Waltham Cross, London, N.
*Sir Joseph Paxton, M. P., Chatsworth, England.
*John L. Payson, late U. S. Consul, Messina.
*Com. M. C. Perry, U. S. Navy.
*David Porter, late U. S. Chargé d' Affaires at the Ottoman Porte.
*Alfred S. Prince, Flushing, N. Y.
*William R. Prince, Flushing, N. Y.
P. T. Quinn, Newark, N. J.
Rev. Rushton Radclyffe, London, England.
*William Foster Redding, Baltimore, Md.
D. Redmond, Ocean Springs, Miss.
M. D. Reynolds, Schenectady, N. Y.
*John H. Richards, M. D., Illinois.
Charles V. Riley, Entomologist, Washington, D. C.
*Mons. J. Rinz, Jr., Frankfort-on-the-Main.
*Thomas Rivers, Sawbridgeworth, Herts, England.
William Robinson, Editor of The Garden, London.
*Dr. J. Smyth Rogers, New York.
*Capt. William S. Rogers, U. S. Navy.
Bernard Rosier, M. D., Athens, Greece.
*Thomas Rotch, Philadelphia.
*George R. Russell, Roxbury.
John B. Russell, Newmarket, N. J.
*Rev. John Lewis Russell, Salem.
William Saunders, Department of Agriculture, Washington, D. C.
*William Shaler, late U. S. Consul-General, Havana, Cuba.
*Caleb R. Smith, Burlington, N. J.

*Daniel D. Smith, Burlington, N. J.
*Gideon B. Smith, late Editor of the American Farmer, Baltimore.
John Jay Smith, Germantown, Pa.
*Horatio Sprague, late U. S. Consul, Gibraltar.
Robert W. Starr, Port William, Nova Scotia.
Dr. John Stayman, Leavenworth, Kansas.
*Thomas H. Stevens, U. S. Navy, Middletown, Conn.
William F. Strangeway, British Secretary of Legation at Naples.
Dr. J. Strentzel, Martinez, Cal.
*James P. Sturgis, Canton.
William Summer, Pomaria, S. C.
Francis Summerest.
*Prof. Tenore, late Director of the Botanic Garden at Naples.
*J. E. Teschemacher, Boston.
*Robert Thompson, London.
*George C. Thorburn, New York.
Prof. George Thurber, Editor of the American Agriculturist, New York.
John Tilson, Jr., Edwardsville, Illinois.
Cav. Doct. Vincent Tinio, Director of the Botanic Garden at Palermo.
*Luther Tucker, Editor of the Cultivator, Albany, N. Y.
Carey Tyso, Wallingford, England.
*Louis Van Houtte, Ghent, Belgium.
*Alexander Vattemare, Paris.
*Emilien de Wael, Antwerp, Belgium
John A. Warder, M. D., President of the Ohio State Horticultural Society, Cleves, O.
Anthony Waterer, Knapp Hill, near Woking, Surrey, England.
*J. Ambrose Wight, Editor of the Prairie Farmer, Chicago, Ill.
Benjamin Samuel Williams, Holloway, London, N.
Prof. John Wilson, Edinburgh University, Scotland.
*William Wilson, New York.
*Col. J. F. Wingate, Bath, Me.
*Joshua Wingate, Portland.
*Joseph Augustus Winthrop, Charleston, South Carolina.

MEMBERS FOR LIFE.

Change of residence, or any inaccuracies, should be promptly reported to the Secretary.

Adams, George E.,	Medford.	Bates, Amos,	Hingham.
Albro, Charles,	Taunton.	Bates, Caleb,	Kingston.
Alger, R. F.,	Hinsdale.	Bayley, John P.,	Boston.
Ames, F. L.,	Easton.	Beal, Alexander,	Dorchester.
Ames, F. M.,	Canton.	Beckford, D. R., Jr.,	Dedham.
Ames, George,	Boston.	Bell, Joseph H.,	Quincy.
Ames, P. A.	"	Bemis, Emery,	Grantville.
Amory, Charles,	"	Berry. James,	Boston.
Amory, Frederick,	Brookline.	Bickford, Weare D.,	Allston.
Amory, James S.,	Boston.	Birchard, Charles,	Arlington.
Anderson, Alexander,	Hingham.	Black, J. W.,	Boston.
Andrews, Charles L.,	Swampscott.	Blagg, Samuel	Newbern, N. C.
Andrews, Frank W.,	Boston.	Blanchard, J. W.,	Boston.
Andrews, W. T.,	"	Blaney, Henry,	Brookline.
Andros, Milton,	Brookline.	Blinn, R. D.,	Lexington.
Appleton, Edward,	Reading.	Bocher, F.,	Boston.
Appleton, Francis H.,	Peabody.	Bockus, C. E.,	Dorchester.
Appleton, Wm. S.,	Boston.	Bond, George W.,	Boston.
Atkins, Elisha,	Belmont.	Borland, J. N.,	"
Avery, Edward,	Boston.	Botume, John,	Stoneham.
Ayer, Adams,	"	Bowker, Wm. H.,	Boston.
Ayling, Isaac,	"	Bouvé, Thomas T.,	"
		Bowditch, A. C.,	Somerville.
Bacon, George,	Brookline.	Bowditch, J. Ingersoll,	Boston.
Bailey, Edwin C.,	Concord, N. H.	Bowditch, Wm. E.,	"
Baker, Wm. E.	Boston.	Brackett, C. H.,	Brighton.
Bancroft, J. C.,	Milton.	Brackett, C. N.,	Newton.
Banfield, F. L.,	Boston.	Bradish, L. J.	Boston.
Barnard, Rev. C. F.,	"	Bragg, S. A. B.,	Mattapan.
Barnard, James M.,	"	Breed, Andrews,	Lancaster.
Barnard, R. M.,	Everett.	Breed, Henry A.,	Lynn.
Barnes, Walter S.,	Somerville.	Bresee, Albert,	Hortonville, Vt.
Barnes, Wm. H.,	Boston.	Brewer, John Reed,	Boston.
Barney, Levi C.,	"	Brewer, Otis,	"
Barratt, James,	Cambridge.	Brigham, W. T.,	"
Barrows, Thomas,	Dedham.	Bright, Jona. B.,	Waltham.
Bartlett, E.,	Newburyport.	Bright, William E.,	"

Brimmer, Martin,	Boston.	Clapp, J. H.,	Dorchester.
Brintnall, Benj.,	"	Clapp, Lemuel,	"
Brooks, Francis,	Medford.	Clapp, William C.,	"
Brooks, J. W.,	Milton.	Clark, Orus,	Boston.
Brooks, Peter C.,	Boston.	Clark, W. L.,	Neponset.
Brown, Charles E.,	Yarmouth, N.S.	Clark, William S.,	Amherst.
Brown, Edward J.,	Brookline.	Clarke, Miss Cora H.,	Jamaica Plain.
Brown, G. Barnard,	Boston.	Clay, Henry,	Dorchester.
Brown, George B.,	"	Cleary, Lawrence,	West Roxbury.
Brown, Jacob,	Woburn.	Clement, Asa,	Dracut.
Brownell, E. S.,	Essex Junc., Vt.	Cleveland, Ira,	Dedham.
Bruce, N. F.,	Stoneham.	Cobb, Albert A.,	Brookline.
Bullard, Wm. S.,	Boston.	Coburn, Isaac E.,	Everett.
Burnett, Joseph,	Southborough.	Codman, James M.,	Brookline.
Burnham, T. O. H. P.,	Boston.	Codman, Ogden,	Lincoln.
Burr, Fearing,	Hingham.	Coffin, G. Winthrop,	West Roxbury.
Burr, Matthew H.,	"	Coffin, William E.,	Boston.
Buswell, E. W.,	Boston.	Converse, E. S.,	Malden.
Buswell, Frank E.,	"	Coolidge, Joshua,	Watertown.
Butler, Aaron,	Wakefield.	Copeland, Franklin,	West Dedham.
Butterfield, Wm. P.,	Arlington.	Cox, George P.,	Malden.
		Coy, Samuel I.,	Boston.
Cadness, John,	Flushing, N. Y.	Craft, George,	Brookline.
Cains, William,	South Boston.	Crocker, Uriel,	Boston.
Calder, A. P.,	Boston.	Crosby, Josiah,	Arlington.
Capen, John,	"	Crowell, Philander,	Chelsea.
Carlton, Samuel A.,	Somerville.	Crowell, R. H.,	"
Carruth, Charles,	Boston.	Cruickshanks, James,	"
Carruth, Nathan,	Dorchester.	Cummings, John,	Woburn.
Carter, Miss Sabra,	Wilmington.	Curtis, Charles F.,	West Roxbury.
Chamberlain, C. W.,	Arlington.	Curtis, George S.,	Jamaica Plain.
Chandler, J. G.,	Lancaster.	Cushing, J. G.,	Boston.
Chapin, N. G.,	Brookline.	Cushing, R. M.,	"
Chapman, Edward,	Arlington.		
Chase, A. J.,	Lynn.	Daggett, H. C.,	Boston.
Chase, Daniel E.,	Somerville.	Damon, Samuel G.,	Arlington.
Chase, Hezekiah S.,	Boston.	Dana, Charles B.,	Brookline.
Chase, William M.,	Worcester.	Darling, Charles K.,	Boston.
Cheney, B. P.,	Boston.	Davenport, Edward,	Dorchester.
Child, F. J.,	Cambridge.	Davenport, Geo. E.,	Boston.
Child, William C.,	Medford.	Davenport, Henry,	"
Childs, Francis,	Charlestown.	Davis, Curtis,	Cambridge.
Childs, N. R.,	Dorchester.	Davis, Hervey,	Cambridgeport.
Claflin, Henry,	Brighton.	Dawson, Jackson,	West Roxbury.
Claflin, William,	Newton.	Deblois, S. G.,	Boston.
Clapp, Edward B.,	Dorchester.	Denny, C. H.,	"
Clapp, E. W.,	Walpole.	Denny, R. S.,	Dorchester.

Denton, Eben,	Braintree.
DeWolf, John L.,	Boston.
Dewson, F. A.,	"
Dexter, F. Gordon,	"
Dickerman, Geo. H.,	Somerville.
Dickinson, Alex.,	Cambridgeport.
Dike, Charles C.,	Stoneham.
Dix, Joseph,	Boston.
Dorr, George,	Dorchester.
Dove, George W. W.,	Andover.
Downer, Samuel,	Dorchester.
Durant, H. F.,	Boston,
Durant, William,	"
Durfee, Mrs. F. B.,	Fall River.
Durfee, George B.,	" "
Eaton, Horace,	Quincy.
Eldridge, E. H.,	Boston.
Ellicott, J. P.,	Jamaica Plain.
Endicott, Wm. E.,	Canton.
Everett, George,	Concord.
Everett, Otis,	Boston.
Everett, William,	"
Farlow, John S.,	Newton.
Faxon, John,	Quincy.
Fay, Mrs. R. L.,	Chelsea.
Fenno, J. B.,	Boston.
Fewkes, Edwin,	Ipswich.
Fillebrown, John,	Arlington.
Fisher, James,	Boston.
Fisher, Warren,	"
Flagg, Augustus,	Boston,
Fleming, Edwin,	West Newton.
Fleming, William,	" "
Fletcher, J. W.,	Chelsea.
Flint, Charles L.,	Boston.
Flint, D. B.,	Watertown.
Flynt, William N.,	Monson.
Foster, John H.,	Boston.
Fowle, W. B.,	Auburndale.
Freeland, Chas. Wm.,	Boston.
Freeman, Abraham,	Dorchester.
French, Jonathan,	Boston.
French, J. D. W.,	"
Fuller, Henry Weld,	"
Galvin, John,	West Roxbury.
Gardner, Henry N.,	Belmont.
Gibbs, Wolcott,	Cambridge.
Gillard, William,	Boston.
Gilson, F. Howard,	Reading.
Glover, Albert,	Boston.
Glover, Joseph B.,	"
Goddard, A. Warren,	Brookline.
Goddard, Mrs. M. T.,	Newton.
Gorham, J. L.,	Jamaica Plain.
Gould, Francis,	Arlington.
Gould, Samuel,	Boston.
Gray, James,	Wellesley.
Gregory, J. J. H.,	Marblehead.
Greig, George,	Newton.
Grinnell, Joseph,	New Bedford.
Groom, Thomas,	Dorchester.
Grundel, H.,	"
Guild, J. Anson,	Brookline.
Hadwen, O. B.,	Worcester.
Hall, Edwin A.,	Cambridgeport.
Hall, George A.,	Chelsea.
Hall, George R.,	Boston.
Hall, John R.,	"
Hall, Lewis,	Cambridge.
Hall, Stephen A.,	Revere.
Hall, William F.,	Brookline.
Halliday, W. H.,	Boston.
Hammond, Gard. G.,	"
Hammond, Samuel,	"
Harding, C. L.,	Cambridge.
Harding, G. W.,	Dorchester.
Harding, L. B.,	Boston.
Harding, W. C.,	"
Hardy, F. D., Jr.,	Cambridgeport.
Harris, Charles,	Cambridge.
Hastings, Edm. T.,	Boston.
Hatch, Anthony,	Cliftondale.
Hathaway, Seth W.,	Marblehead.
Haughton, James,	Boston.
Hayden, A. W.,	Portsm'th, N. H.
Hayes, Daniel F.,	Exeter, N. H.
Hayes, Francis B.,	Boston.
Hazeltine, H.,	"
Head, Charles D.,	Brookline.
Hilbourn, A. J.,	Chelsea.

Hill, George,	Arlington.	Keyes, E. W.	Denver, Col.
Hill, John,	Stoneham.	Keyes, George,	Concord.
Hitchings, E. H.,	Boston.	Kidder, H. P.,	Boston.
Hodgkins, John E.,	Chelsea.	Kimball, A. P.,	"
Hollis, J. W.,	Brighton.	King, Franklin,	Dorchester.
Holt, Mrs. S. A.,	Winchester.	King, William S.,	Boston.
Hooper, Robert C.,	Boston.	Kingman, A. A.,	Brookline.
Hooper, Thomas,	Bridgewater.	Kingman, C. D.,	Middleborough.
Horner, Mrs. C. N. S.,	Georgetown.	Kinsley, Lyman,	Cambridgeport.
Hovey, C. H.,	Cambridge.	Kittredge, E. A.,	Boston.
Hovey, C. M.,	"		
Hovey, John C.,	Cambridgeport.	Lamb, Thomas,	Boston.
Hovey, P. B.,	"	Lancaster, C. B.,	Newton.
Howe, George,	Boston.	Lawrence, Amos A.,	Brookline.
Howland, John, Jr.,	New Bedford.	Lawrence, Edward,	Charlestown.
Hubbard, Charles T.,	Boston.	Lawrence, James,	Boston.
Hubbard, G. G.,	Cambridge.	Lawrence, James,	Groton.
Hubbard, J. C.,	Boston.	Lawrence, John,	Boston.
Hubbard, W. J.,	"	Lawson, Peter,	Lowell.
Huckins, J. W.,	"	Leavens, S. Davis,	Boston.
Humphrey, F. J.,	Dorchester.	Lee, Henry,	"
Humphrey, G. W.,	Dedham.	Lemme, Frederick,	Natick.
Hunneman, Jos. H.,	Boston.	Leuchars, R. B.,	Boston.
Hunnewell, H. H.,	Wellesley.	Lewis, A. S.,	Framingham.
Hunt, Franklin,	Boston.	Lewis, William G.,	"
Hunt, Moses,	"	Lincoln, D. Waldo,	Worcester.
Hyde, J. F. C.,	Newton.	Lincoln, George,	Hingham.
		Locke, W. H.,	Belmont.
Inches, Henderson,	Boston.	Lodge, Giles H.,	Swampscott.
Inches, Herman B.,	"	Loftus, John P.,	Boston.
		Loomis, J. B.,	Chelsea.
Jackson, Abraham,	Boston.	Lord, George C.,	Newton.
Janvrin, W. S.,	Revere.	Loring, Alfred,	South Hingham.
Jeffries, John, Jr.,	Boston.	Loring, C. W.,	Boston.
Jenks, C. W.,	"	Lothrop, Eben W.,	Chelsea.
Johnson, Francis M.,	Newton Centre.	Lovett, G. L.,	Boston.
Joyce, Mrs. Samuel,	Medford.	Low, Ariel,	"
		Lowder, John,	Watertown.
Kakas, Edward,	Medford.	Lowell, Augustus,	Boston.
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Kendall, D. S.,	Woodstock, Ont.	Lumb, Wm.,	Boston.
Kendall, Edward,	Cambridgeport.	Lunt, C. H.,	Jamaica Plain.
Kendall, J. R.,	Woburn.	Lyman, Theodore,	Brookline.
Kendrick, Mrs. H. P.,	Allston.	Lyon, Henry,	Charlestown.
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Kenney, John M.,	Wareham.	Mahoney, John,	Boston.
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Manning, Mrs. L. B.,	"
Manning, Robert,	Salem.
Mansfield, H. S.,	Blackstone.
Marland, A.,	Andover.
Marsh, Francis,	Dedham.
Marshall, Frederick,	Everett.
Martin, D. A.,	Chelsea.
Martin, J. S.,	Boston.
Mason, R. M.,	"
Matthews, Nathan,	"
McCarthy, T.,	"
McClure, John,	Revere.
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Miller, E. D.,	Dorchester.
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Milmore, M ,	"
Milton, W. H.,	"
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Mixter, Charles,	Boston.
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Morse, S. B.,	"
Morse, Samuel F.,	"
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Perkins, Edward N.,	Brookline.
Perkins, William P.,	"
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Pierce, S. B.,	"
Poole, Benjamin C.,	Chelsea.
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Potter, Joseph S.,	Arlington.
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Pratt, Robert M.,	"
Pratt, William,	Winchester.
Pray, Mark W.,	Malden.
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Prescott, Eben C.,	Boston.
Prescott, W. G.	"
Prescott, William G.,	Quincy.
Preston, George H.,	Boston.
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Rand, Oliver J.,	Cambridgeport.
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Robinson, J. H.,	Dorchester.	Speare, Alden,	Newton Centre.
Rogers, John H.,	Boston.	Springall, George,	Malden.
Ross, Henry,	Newton.	Springer, John,	Sterling.
Ross, M. D.,	Boston.	Stetson, James A.,	Quincy.
Ross, Waldo O.,	"	Stetson, Nahum,	Bridgewater.
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Sargent, Charles S.,	Brookline.	Strong, William C.,	"
Sargent, Ignatius,	"	Sturgis, John H.,	Boston.
Saville, R. L.,	"	Sturgis, Russell, Jr.,	"
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Sawyer, Timothy T.,	Charlestown.	Sumner, Edward,	Dedham.
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Seaver, Nathaniel,	East Boston.		
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Shaw, S. P.,	Cambridge.	Taylor, Horace B.,	"
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Shorey, John L,	Lynn.	Thorndike, John H.,	Boston.
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Smith, Charles A.,	Boston.	Tolman, Miss H. S.,	Boston.
Smith, Charles H.,	Jamaica Plain.	Torrey, Everett,	Charlestown.
Smith, Chauncy,	Cambridge.	Turner, J. M.,	Dorchester.
Smith, E. N.,	Boston.	Turner, R. W.,	Newton.
Smith, George O.,	"	Turner, Royal W.,	Randolph.
Smith, James H,	Needham.		

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Vass, W. J.,	Boston.
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Walcott, Edward,	Pawtucket.
Walcott, Henry P.,	Cambridge.
Walker, Edw. C. R.,	Boston.
Walker, Samuel A.,	"
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Walley, Mrs. W. P.,	Boston.
Ward, John,	Newton.
Wardwell, W. H.,	" Centre.
Ware, Benjamin P.,	Marblehead.
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Wason, E.,	Brookline.
Waters, Edwin F.,	Newton Centre.
Waters, George F.,	Newton.
Watts, Isaac,	Belmont.
Webber, A. D.,	Boston.
Weld, Aaron D.,	West Roxbury.
Weld, Dr. M. W.,	Boston.
Weld, Richard H.,	"
Weld, W. G.,	Brookline.
Weston, L. W.,	Lincoln.
Weston, Seth,	Revere.
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Winship, Herman,	"
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Woerd, C. V., Jr.,	"
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Atkinson, Edward,	"	Carter, Maria E.,	Woburn.
Atkinson, John,	West Newton.	Cartwright, James,	Wellesley.
Atkinson, W. B.,	Newburyport.	Chadbourne M. W.,	Watertown.
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Barker, John G.,	Lynn.	Clark, Joseph,	Canton.
Barnard, Mrs. Joel,	Arlington H'ts.	Clark, Joseph W.,	Dedham.
Barnes, Parker,	Dorchester.	Cobb, Jonathan H.,	"
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Beebe, J. Arthur,	Boston.	Cole, H. Hammond,	Chelsea.
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Bird, John L.,	Dorchester.	Converse, Parker L.,	Woburn.
Black, John A.,	Boston.	Cooke, Henry C.,	West Newton.
Bliss, B. K.,	New York.	Cox, James F.,	Abington.
Bolles, Matthew,	Boston.	Crafts, W. A.,	Boston.
Bolles, William P.,	"	Cruickshanks, J. T.,	Natick.
Bolton, John B.,	Somerville.	Curtis, D. T.,	Boston.
Boott, William,	Boston.	Curtis, Joseph H.,	"
Bradlee, J. T.,	"	Cutter, George B.,	Weston.
Breck, C. H.,	Brighton.		
Breck, C. H. B.,	"	Darling, Moses, Jr.,	South Boston.
Brewer, Thomas M.,	Boston.	Davis, Frederick,	Newton.
Brooks, George,	Brookline.	Davis, James,	Boston.
Brown, A. S.,	Jamaica Plain.	Davis, Thomas M.,	Cambridgeport.
Brown, Atherton T.,	Boston.	Day, George B.,	Boston.

Dean, A. J.,	Boston.	Grant, Charles E.,	Boston.
Denison, J N.,	"	Graves, Frank H.,	West Newton.
Dillaway, Chas. K ,	"	Gray, Edward,	Boston.
Doogue, William,	"	Gray, Howard,	Dorchester.
Downe, Sumner,	Malden.	Gray, John C.,	Boston.
Downes, Mrs. S. M.,	Andover.	Gray, Wm., Jr.,	Dorchester.
Duffley, Daniel,	Brookline.	Gray, Wm., 8d,	"
Dupee, James A.,	"	Grew, Henry,	"
Dyer, Mrs. E. D.,	Eyota, Minn.	Guerineau, Louis,	Malden.
Eaton, Jacob,	Cambridgeport.	Haines, Robert J.,	Boston.
Edgar, William,	Newtonville.	Haley, Jesse,	Cambridgeport.
Eustis, James,	Wakefield.	Hall, William T.,	Revere.
Ewings, L. B.,	Boston.	Hamlin, D. A.,	South Boston.
		Harris, Miss Ellen M.,	Jamaica Plain.
Falconer, John,	Rochester.	Harris, F. L.,	South Natick.
Falconer, William,	Cambridge.	Hartwell, Samuel,	Lincoln.
Farrier, Amasa,	Stoneham.	Harwood, Geo. S.,	Newton.
Farrier, Mrs. C.,	"	Haskell, Edward,	New Bedford.
Fay, Henry G.,	Brookline.	Hatch, Samuel,	Boston.
Felton, A. W.,	West Newton.	Hayes, John L.,	Cambridge.
Fenno, Warren,	Revere.	Hayward, Geo. P.,	Hingham.
Fletcher, Edwin,	Acton.	Hazleton, H. L.,	Boston.
Foster, Joshua T.,	Medford.	Heath, Geo. W.,	Melrose.
Foster, Nath'l, Jr.,	Belmont.	Hersey, Alfred H.,	Hingham.
Fowle, H. D.,	Boston.	Heustis, Warren,	Belmont.
French, Henry F.,	Concord.	Hews, Albert H.,	No. Cambridge.
French, W. E.,	Boston.	Higbee, C. H.,	Salem.
Frost, George,	West Newton.	Hill, Benj. D.,	Peabody.
Frost, Stiles,	" "	Hill, Henry Y.,	Belmont.
Fuller, W. G.	Stoneham.	Hill, Miss K. A.,	Lowell.
		Hinckley, Mrs. D. F.,	Chelsea.
Gane, Henry A.,	West Newton.	Hittinger, Miss M. E.,	Belmont.
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Garfield, Charles,	Medford.	Hubbard, J. W.,	Boston.
Gaut, S. N.,	Somerville.		
Gay, Timothy,	Chelsea.	Ireland, George W.,	Somerville.
Gilbert, John,	Boston.		
Gilbert, Samuel,	"	Jameson, G. W.,	East Lexington.
Gilbert, W. A.,	Neponset.	Jones, Moses,	Brookline.
Gill, Mrs. E. M.,	Medford.	Jordan, Samuel,	Yarmouth.
Gleason, C. W.,	Boston.		
Gleason, Herbert,	Malden.	Kelsey, Fred W.,	Waverly, N. Y.
Godbold, G. A.,	Chelsea.	Kendall, Jonas,	Framingham.
Goddard, Thomas,	Boston.	Kennard, M. P.,	Brookline.
Goodwin, Lester,	Brighton.	Kenrick, Miss A. C.,	Newton.

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Adams, Chas. F.,	Quincy.
Adams, C. S.,	Framingham.
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Allen, Calvin,	Boston.
Allen, Nathaniel T.,	West Newton.
Allen, W. H.,	Dedham.
Ames, R. W.,	Boston.
Anderson, C. J.,	Longwood.
Atkinson, Chas. M.,	Brookline.
Atkinson, Edward,	"
Atkinson, John,	West Newton.
Atkinson, W. B.,	Newburyport.
Batchelder, Samuel,	Cambridge.
Bacon, Augustus,	Boston.
Bacon, William,	"
Bard, James,	Framingham.
Barker, John G.,	Lynn.
Barnard, Mrs. Joel,	Arlington H'ts.
Barnes, Parker,	Dorchester.
Bayley, Dudley H.,	Boston.
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Beebe, J. Arthur,	Boston.
Bird, Charles,	Revere.
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Bolles, Matthew,	Boston.
Bolles, William P.,	"
Bolton, John B.,	Somerville.
Boott, William,	Boston.
Bradlee, J. T.,	"
Breck, C. H.,	Brighton.
Breck, C. H. B.,	"
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Brown, A. S.,	Jamaica Plain.
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Bryant, G. J. F.,	"
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Capen, Aaron D.,	Mattapan.
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Cartwright, James,	Wellesley.
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Chase, Henry L.,	Lynn.
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Clark, James W.,	Framingham.
Clark, Joseph,	Canton.
Clark, Joseph W.,	Dedham.
Cobb, Jonathan H.,	"
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Cole, H. Hammond,	Chelsea.
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Converse, Parker L.,	Woburn.
Cooke, Henry C.,	West Newton.
Cox, James F.,	Abington.
Crafts, W. A.,	Boston.
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Curtis, D. T.,	Boston.
Curtis, Joseph H.,	"
Cutter, George B.,	Weston.
Darling, Moses, Jr.,	South Boston.
Davis, Frederick,	Newton.
Davis, James,	Boston.
Davis, Thomas M.,	Cambridgeport.
Day, George B.,	Boston.

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Denison, J N.,	"	Graves, Frank H.,	West Newton.
Dillaway, Chas. K ,	"	Gray, Edward,	Boston.
Doogue, William,	"	Gray, Howard,	Dorchester.
Downe, Sumner,	Malden.	Gray, John C.,	Boston.
Downes, Mrs. S. M.,	Andover.	Gray, Wm., Jr.,	Dorchester.
Duffley, Daniel,	Brookline.	Gray, Wm., 8d,	"
Dupee, James A.,	"	Grew, Henry,	"
Dyer, Mrs. E. D.,	Eyota, Minn.	Guerineau, Louis,	Malden.
Eaton, Jacob,	Cambridgeport.	Haines, Robert J.,	Boston.
Edgar, William,	Newtonville.	Haley, Jesse,	Cambridgeport.
Eustis, James,	Wakefield.	Hall, William T.,	Revere.
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		Harris, Miss Ellen M.,	Jamaica Plain.
Falconer, John,	Rochester.	Harris, F. L.,	South Natick.
Falconer, William,	Cambridge.	Hartwell, Samuel,	Lincoln.
Farrier, Amasa,	Stoneham.	Harwood, Geo. S.,	Newton.
Farrier, Mrs. C.,	"	Haskell, Edward,	New Bedford.
Fay, Henry G.,	Brookline.	Hatch, Samuel,	Boston.
Felton, A. W.,	West Newton.	Hayes, John L.,	Cambridge.
Fenno, Warren,	Revere.	Hayward, Geo. P.,	Hingham.
Fletcher, Edwin,	Acton.	Hazleton, H. L.,	Boston.
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Foster, Nath'l, Jr.,	Belmont.	Hersey, Alfred H.,	Hingham.
Fowle, H. D.,	Boston.	Heustis, Warren,	Belmont.
French, Henry F.,	Concord.	Hews, Albert H.,	No. Cambridge.
French, W. E.,	Boston.	Higbee, C. H.,	Salem.
Frost, George,	West Newton.	Hill, Benj. D.,	Peabody.
Frost, Stiles,	" "	Hill, Henry Y.,	Belmont.
Fuller, W. G.	Stoneham.	Hill, Miss K. A.,	Lowell.
		Hinckley, Mrs. D. F.,	Chelsea.
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Gardiner, Claudius B.,	Newburyport.	Hodgdon, R. L.	Arlington.
Gardner, John,	Dedham.	Howe, Rufus,	Marlboro'.
Garfield, Charles,	Medford.	Hubbard, J. W.,	Boston.
Gaut, S. N.,	Somerville.		
Gay, Timothy,	Chelsea.	Ireland, George W.,	Somerville.
Gilbert, John,	Boston.		
Gilbert, Samuel,	"	Jameson, G. W.,	East Lexington.
Gilbert, W. A.,	Neponset.	Jones, Moses,	Brookline.
Gill, Mrs. E. M.,	Medford.	Jordan, Samuel,	Yarmouth.
Gleason, C. W.,	Boston.		
Gleason, Herbert,	Malden.	Kelsey, Fred W.,	Waverly, N. Y.
Godbold, G. A.,	Chelsea.	Kendall, Jonas,	Framingham.
Goddard, Thomas,	Boston.	Kennard, M. P.,	Brookline.
Goodwin, Lester,	Brighton.	Kenrick, Miss A. C.,	Newton.

Lamprell, Simon,	Marblehead.	Olney, Richard,	West Roxbury,
Lang, John H. B.,	Dorchester.	Owen, John,	Cambridge.
Langmaid, S. P.,	Somerville.		
Langworthy, I. P.,	Chelsea.	Paine, Benjamin F.,	Boston.
Leavens, E. W.,	Malden.	Park, W. D.,	"
Lee, Francis H.,	Salem.	Parker, Harvey D.,	"
Lincoln, F. W., Jr.,	Boston.	Parker, John,	"
Livermore, Isaac,	Cambridgeport.	Parsons, William,	"
Livermore, Miss M.,	Mt. Auburn.	Parsons, William B.,	Rockport.
Loring, Charles G.,	Boston.	Patterson, James,	Cambridge.
Loring, John A.,	"	Payson, Samuel R.,	Boston.
Lothrop, D. W.,	West Medford.	Pettingill, Thos. S.,	Brookline.
Lothrop, H. A.,	Sharon.	Phillips, Nathaniel,	Dorchester.
Lothrop, Thornton K.,	Boston.	Plimpton, W. P.,	West Newton.
Lowell, John,	Newton.	Power, Charles J.,	S. Framingham.
		Pratt, L. G.,	West Newton.
Markoe, G. F. H.,	Boston.	Pratt, Samuel,	Chelsea.
May, F. W. G.,	"	Putnam, C. A.,	Salem.
McDermott, Andrew,	"	Putnam, H. W.,	"
McIntosh, A. S.,	"		
McLaren, Anthony,	Forest Hills.	Randall, Macey,	Sharon.
Mellen, George M.,	Brookline.	Ranlett, S. A.,	Melrose.
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Merrill, S. A.,	Danvers.	Richardson, Horace,	Framingham.
Millar, John L.,	Boston.	Ridler, Charles E.,	Kingston.
Miller, David,	"	Roberts, Edward,	Hyde Park.
Minton, P. J.,	Forest Hills.	Rogers, John F.,	Cambridge.
Morandi, Francis,	Malden.	Russell, George,	Boston.
Morris, Thomas D.,	Boston.		
Morrison, Hugh,	Gloucester.	Saunders, Miss M.T ,	Salem.
Morse, W. A.,	Boston.	Saville, George,	Quincy.
Morton, J. H.,	"	Sawtell, J. M.,	Fitchburg.
Murray, Daniel C.,	Brookline.	Schlegel, Adam,	Boston.
Muzzey, A. B.,	Cambridge.	Scott, A. E.,	Lexington.
		Scott, George H.,	Allston.
Nichols, J. R.,	Haverhill.	Scudder, Samuel H.,	Cambridge.
Nightingale, Crawford,	Dorchester.	Shattuck, F. R.,	Boston.
Northey, William,	Medford.	Shedd, Abraham B.,	Lexington.
Norton, M. H.,	Boston.	Shedd, Arthur B.,	"
Norton, P.,	"	Shepherd, C. W.,	West Newton.
Noyes, George N.,	Auburndale.	Shepherd, Edwin,	Lowell.
Nugent, James,	Boston.	Sherman, Japhet,	Medford.
		Simpson, Michael H.,	Saxonville.
O'Brien, James,	Jamaica Plain.	Sleeper, J. S.	Boston.
Odiorne, F. H.,	Malden.	Snow, E. A.,	Melrose.
Oldreive, Richard,	Newton.	Southworth, Edward,	Quincy.

Spooner, W. H.,	Jamaica Plain.	Walker, Joseph T.,	Boston.
Sprague, Charles J.,	Boston.	Walker, Wm. P.,	Somerville.
Squire, J. P.,	Arlington.	Wallis, William,	Boston.
Starbird, Louis D.,	Malden.	Walsh, M. H.,	Brighton.
Stearns, Charles,	Brookline.	Washburn, E. F.,	Neponset.
Stone, Eliphalet,	Dedham.	Watson, David,	Malden.
Stevenson, Hamilton,	Woburn.	Webster, John,	Salem.
Stone, Samuel G.,	Charlestown.	Wellington, Chas. A.,	E. Lexington.
Story, Miss SarahW.,	Brighton.	Wellington, Jos. V.,	Cambridge.
Sullivan, J. L. D.,	Somerville.	Wells, Benjamin T.,	Boston.
Swan, C. W.,	Boston.	Weston, Mrs. L. P.,	Danvers.
		Wheatland, Henry,	Salem.
Tailby, Joseph,	Wellesley.	Wheeler, Miss Ann C.	Cambridgeport.
Tainter, A. E.,	Medford.	Wheildon, Wm. W.,	Concord.
Talbot, Josiah W.,	Norwood.	White, N. B.,	Norwood.
Tapper, Thomas,	Canton.	White, T. C.,	Charlestown.
Taylor, Moses,	Acton.	Whitney, Joel,	Winchester.
Tobey, Miss M. B.,	Brookline.	Wilde, Hiram,	Randolph.
Todd, Jacob,	Boston.	Williams, Dudley,	Jamaica Plain.
Torrey, Augustus.	Beverly.	Wilmarth, H. D.,	" "
Tower, Elisha,	Lexington.	Wilson, B. O.,	Watertown.
Trautman, Martin,	Boston.	Wilson, George W.,	Malden.
Tucker, E. G.,	"	Wiswall, Henry M.,	Watertown.
Turner, N. W.,	Everett.	Wolcott, Mrs. J. W.,	Boston.
		Wood, Mrs. Anna D.,	West Newton.
Underwood, Wm. J.,	Belmont.	Wood, Miss C. S.,	" "
		Wood, E. W.,	" "
Vandine, Henry,	Cambridgeport.	Woodford, Jos. H.,	Newton.
Vinton, Mrs. C. A.,	Boston.		
		Zirngiebel, D.,	Needham.
Walker, Charles H.,	Chelsea.		

EXTRACTS FROM THE BY-LAWS.

SECTION XXVI.—Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments; and any member, having once paid an admission fee, may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVII.—Admission Fee and Annual Assessment.

Every subscription member, before he receives his Diploma, or exercises

the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIX.—Discontinuance of Membership.

Any member who shall neglect for the space of two years to pay his annual assessment shall cease to be a member of the Society: and the Treasurer shall erase his name from the List of Members.

The attention of Annual Members is particularly called to Section XXIX.

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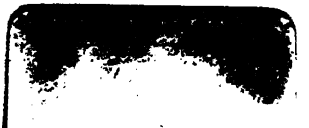

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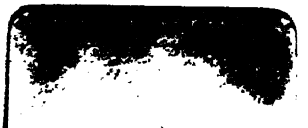

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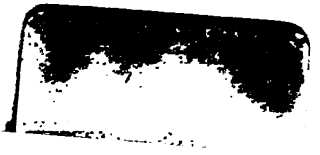
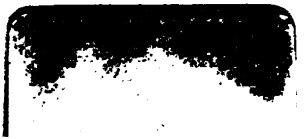
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